TECHNOLOGY DEPT.

MODERN PACKAGING

MAY 1946

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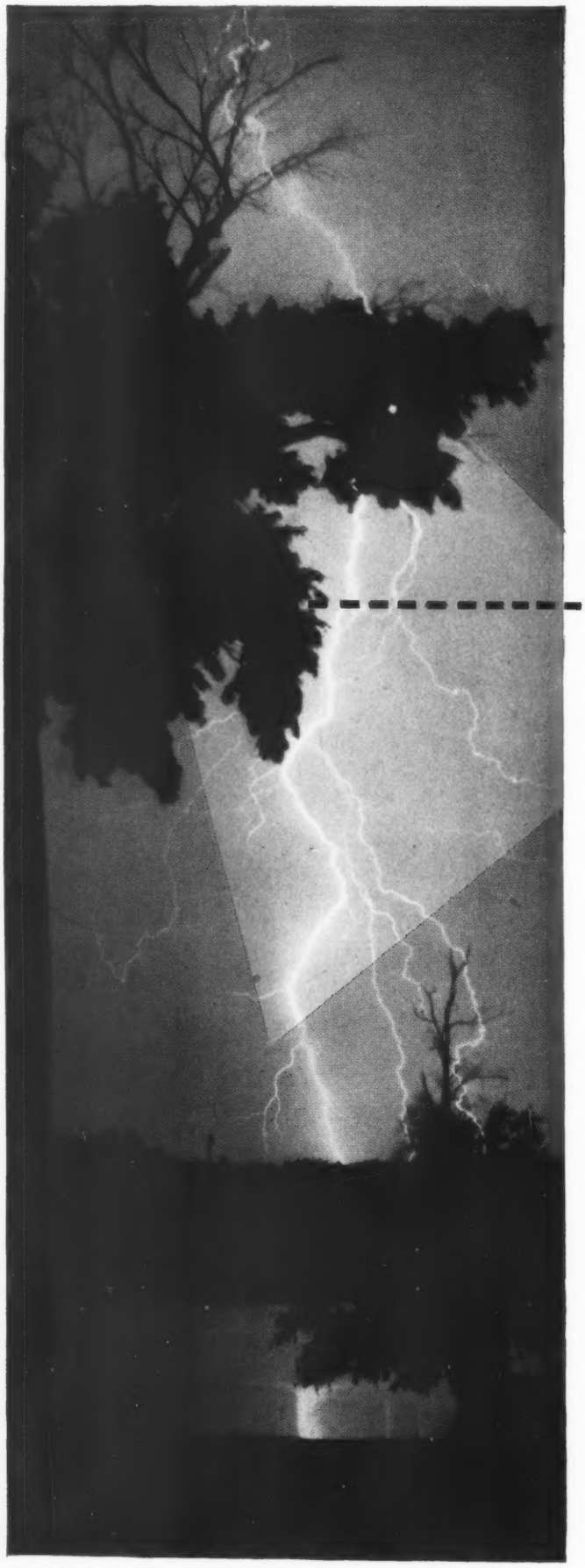


RELY on National... with its knowledge of every type of adhesive formula and use... to provide the exact setting speed for your specific job.

What is your adhesive problem? Do you need *fast adhesion* to get maximum production speeds from modern packaging machinery . . . to increase working floor space by reducing feed conveyer lengths . . . to permit immediate stacking or shipping?

Or, do you need *slow adhesion* . . . for seasoning before hand bottle labeling . . . for delayed contact sealing or assembling . . . for accurately aligned billboard posting?

SHOULD AN ADHESIVE SET *in a flash?*

Setting speed – which must be maintained uniformly in fair weather or foul – is only one of the many properties an adhesive must have to do your specific job. An adhesive must be suited to surface conditions, shop use, storage and shipping hazards. In addition, an adhesive should carry a final factor of operating safety as insurance against commercial variables.

Why? Because the value of an adhesive is based – not upon its almost insignificant unit cost – but upon the final sales protection it gives to your product.

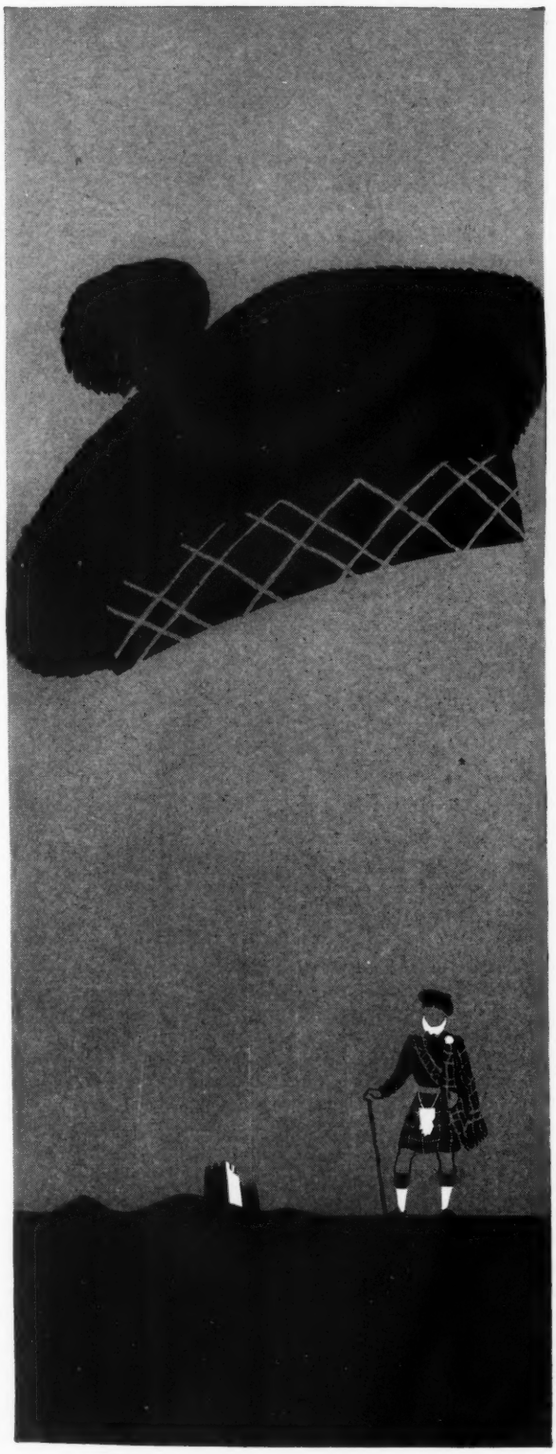
You can rely on National . . . with its long practiced, specialized skill . . . to give careful attention to every factor of your adhesive problem. Your inquiry is invited – NOW!

Offices: 270 Madison Avenue, New York 16; 3641 So. Washtenaw Avenue, Chicago 32; 735 Battery Street, San Francisco 11, and other principal cities. In Canada: Meredith, Simmons & Co., Ltd., Toronto. In England: National Adhesives, Ltd., Slough.

Dunellen Plant

National ADHESIVES

EVERY TYPE OF ADHESIVE FOR EVERY INDUSTRIAL USE



ECONOMICAL

AN ECONOMICAL CAP may be one that sells for the least, or for the most. An economical cap, regardless of price, is one that best serves its purpose . . . and its users. It doesn't upset the production set-up. It provides a protective seal and an efficient reseal. It adds to—doesn't detract from—package attractiveness and utility. That, briefly, describes an economical cap—the worth of which far exceeds its price. That, too, we believe, describes the Phoenix C T Cap, time-saving and trouble-saving for both packer and consumer . . . economical!

Top wear for glassware

PHOENIX METAL CAP CO.
Chicago 8 and Brooklyn 18

MODERN PACKAGING

VOLUME 19 MAY 1946 NUMBER 9

★ ★ ★

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COVER—Wood is one of the most essential packaging materials—wood pulp for paper, lumber for boxes. Today, the world's food supply could be aggravated by a shortage of lumber for shipping boxes. Peter Piening depicts the use of lumber for packaging with colorful botanical symbols on this month's cover, the fifth of our series on basic packaging materials.

THIS CONTINUOUS LOADING REDINGTON CARTONS ARMOUR'S BOUILLON CUBES AT HIGH SPEED.

It takes a properly designed, soundly constructed machine to operate with smooth, quiet, high-speed efficiency *day in and day out*, the kind built by Redington whose record for outstanding packaging machinery goes back *forty-nine (49) years.*

This continuous loading cartoning unit, for example . . . on the job at *Armour and Company* cartoning their nationally popular bouillon cubes. *Five wrapped cubes*, after they are discharged from wrapping machine, are slid into pocket of Redington intake by an operator . . . cartons are magazine-fed and expanded . . . five cubes inserted . . . and the carton is closed by *tucking* in the end flaps.

An *outstanding feature* of this machine is the *short count detector* which makes sure that every carton contains five cubes—if operator *should in error* place less than five cubes in any conveyor pocket the Redington will discharge the short count and not feed carton from magazine.

The *continuous loading mechanism* gently eases the cubes into the carton *at a fraction* of the machine's speed . . . there is a smooth, continuous flow of contents. *In addition*, Redingtons are built with self-aligning roller bearings, a vari-speed drive, turned-and-ground-shafting, individually motor driven vacuum pumps . . . *all outstanding construction features* that add tremendously to daily efficiency—contribute so much to the long life of Redington packaging machines.

This great combination of packaging ingenuity *plus* high engineering standards is why production executives say, "If It's Packaging—Try Redington First."

F. B. REDINGTON CO. (Est. 1897) 110-112 So. Sangamon St., Chicago 7, Ill.

FOR CARTONING • WRAPPING • SPECIAL PACKAGING

REDINGTON
PACKAGING MACHINES

JAR CLOSURES! IMMEDIATE DELIVERY!

A diversity of colors, styles and sizes including standard 33, 38, 43, 45, 48, 51, 53, 58, 63, 70, 83 and 100 mm.

They're here! Plastic molded jar closures are now in full production . . . and at a lowered price scale! New MACK MOLDING automatic set-ups permit greater production economies and efficiencies.

They're good! Plastic molded closures combine rigidity and strength with smart lustrous eye-appeal. They are sanitary, non-corrosive and easily cleaned.

They're accepted! Easily removed, easily replaced—just ask the customer. Write, wire or telephone us about your requirements; your inquiries will be treated in confidence.

If you are not already acquainted with the facilities offered by our three complete and up-to-date plants, the new 8 page booklet "MACK MOLDED EXCELLENCE" will be sent on request. Write for your copy today.

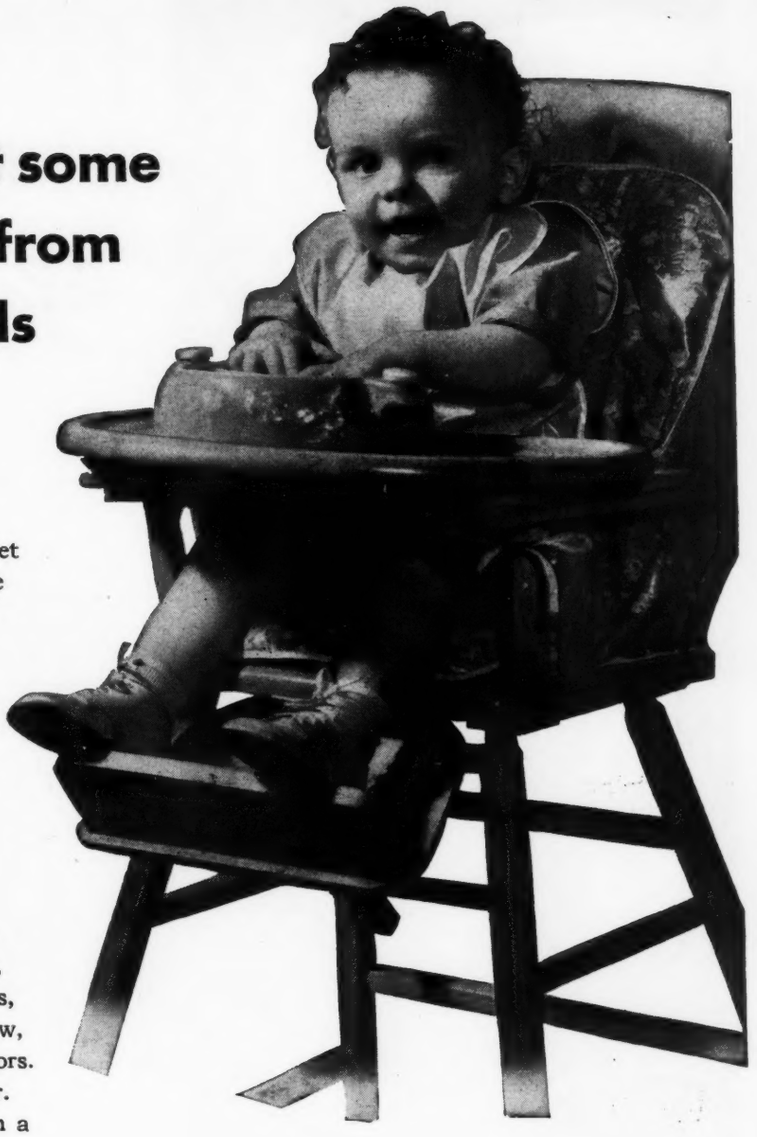
MACK MOLDING COMPANY
INCORPORATED
160 MAIN STREET, WAYNE, NEW JERSEY

Mack
MOLDED EXCELLENCE

SALES OFFICES: NEW YORK CITY, CHICAGO, DETROIT, INDIANAPOLIS, BOSTON & ST. LOUIS

Baby may even get some new shoes—made from GEON raw materials

★



A lot of baby's nursery needs can now be met with products made from or coated with one of the GEON polyvinyl materials. There's a bib, for example, to protect baby's clothing while she eats—seated, incidentally, on a GEON-covered high chair cushion. There are baby pants, a diaper bag, crib sheeting, playpen pad, toilet seat cushion; and soon there may be baby shoes made from GEON because right now GEON is being used in the manufacture of shoe parts of many kinds.

All these products—like all products made from GEON—may be made to resist foods, chemicals, acids and alkalies, oils and greases, wear and scuffing, heat and cold, water, mildew, and many other normally destructive factors. All may be easily washed with soap and water. All may be brilliantly or delicately colored in a wide color range.

And don't forget that GEON can be pressure or injection molded, extruded, calendered or cast into sheet or film. In solution or latex forms it can be applied as coatings for fabrics and fibres of all types as well as for paper and cardboard. There are applications for GEON in *every* industry.

We make no finished products from GEON. But we'll be glad to work with you on any special problems or applications. Just write Dept. L-5, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

Here are a few applications for GEON suggested by the nursery items

- Textile coatings for rainwear, awnings, industrial aprons
- Calendered, embossed sheet for upholstery and luggage
- Calendered or molded sheet for flooring, shoe soles, shower mats
- Paper coatings or film for packaging, wall covering
- Extruded wire and cable insulation

Geon
Polyvinyl Materials
A TRADE MARK OF B. F. GOODRICH CHEMICAL COMPANY

B. F. Goodrich Chemical Company

A DIVISION OF THE B. F. GOODRICH COMPANY

your package must *sell* your name!

TODAY'S *Merchandising Trends

1. *self-service*
2. *convenience*
3. *brand emphasis*
4. *protection*
5. *informative labeling*

* *Based on authoritative surveys of both consumer and retailer preferences.*

Instant, easy recognition of your BRAND through distinctive dynamic packaging is a sure way to bigger sales.

This emphasis of your BRAND in a good package design is the result of careful creation by expert artists—a deliberate ingredient in the overall engineering of a package designed to stimulate consumer attention. Highlighting the Brand Name is one of many reasons why *Packages By Milprint* means packages that sell themselves!

Printed Cellophane, Pliofilm, Glassine, Aluminum Foil, Cellulose Acetate, Vinyl, Lacquer coated and Laminated Papers in all forms, including Sheet Wraps, Rolls, Pouches, or Specialty Bags, Revelation Bread Wraps, Specialty Folding and Window Cartons, Counter Displays, Simplex Pin and Cake Units.

Sales Offices at New York • Chicago
Boston • San Francisco • Philadelphia
Grand Rapids • Los Angeles • Cleveland
Dallas • Minneapolis • Cincinnati • Atlanta
Pittsburgh • St. Louis • Indianapolis
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MILPRINT Inc.

PACKAGING CONVERTERS • PRINTERS • LITHOGRAPHERS

plants at Milwaukee, Philadelphia, Los Angeles, Tucson and San Francisco

PACKAGING HEADQUARTERS TO AMERICAN INDUSTRY

PROTECTED PACKAGES

Star Adhesives

- STAR Case Sealing Gum
- STAR Folding Box Glue
- STAR Cold Pick-Up Gum
- STAR Tin Paste
- STAR Brightwood Gum
- STAR Carton Sealing Glue
- STAR Bench Paste
- STAR Tube Glue
- STAR Lap End Paste
- STAR Tightwrap Glue

Make Your Identity Stick with STAR ADHESIVES

You may need a label adhesive with such sticking qualities that 72 hours of salt water immersion will fail to loosen the label from its bottle. Or your problem may be merely that of sealing a folding carton securely.

In either case a Bingham STAR Adhesive meets your requirements. For many years now we have been making adhesives which do their job well...adhesives which are weatherproof, heatproof, coldproof, handling-proof, and proof against all sorts of special hazards.

We may have just what you need. If not, we will build a new STAR Adhesive for your particular job. Protect your packages with Bingham STAR Adhesives.

BINGHAM BROTHERS COMPANY

PASTES · GLUES · ADHESIVES GUMS · SINCE 1826

NEW YORK
406 Pearl Street

PHILADELPHIA
521 Cherry Street

BALTIMORE
131 Colvin Street

ROCHESTER
980 Hudson Avenue

SLEEK SURFACES ATTRACT BUSY BUYERS

Like a good salesman, a successful folding box is bright and smooth. It's efficient looking. The clean, uniform appearance invites a sale.

Make it easy for your prospects to pick the product in the right carton . . . the one in good taste . . . the one that looks like dependable value.

You find these selling qualities in cartons of RIDGELO Clay Coated Box Board . . . the standard by which others are judged. Let your independent boxmaker show you proofs and compare.

Ridgelo CLAY COATED BOXBOARDS

MADE AT RIDGEFIELD, N. J., BY LOWE PAPER COMPANY

Representatives

H. B. Royce, Detroit • Norman A. Buist, Los Angeles • A. E. Kellogg, St. Louis • Philip Rudolph & Sons, Inc., Philadelphia

PRIMER OF PERFECT PROTECTION

S is for Sirloin

that keeps its red-juiced, mouth-watering tenderness for months on end—

and for Sweet Corn

brought from farm to table with that toothsome, succulent right-off-the-stalk flavor.

CONSUMERS will soon be in for out-of-this-world taste thrills from many foods—fresh or frozen—because you'll be shipping them flavor-locked in **PLIOFILM.** ★ The miracle of this shimmering, transparent wrapping keeps goodness *in* and spoilage *out.* For **PLIOFILM** is air-vapor-moisture-proof. It seals in and holds all the fresh flavor, juiciness and vitamins of fruits and vegetables—brings them to market with that just-picked taste. ★ And **PLIOFILM** wrapping on perishables to be frozen—such as meats, fruit juices, sea foods—means perfect storage for months without loss of taste or texture, because **PLIOFILM** prevents "freezer burn," dehydration, shrinkage or flavor loss. ★ Countless tests by leading food packers and agricultural colleges have proved these **PLIOFILM** wonders. Now, with this wrapping magic soon returning, you'll be packaging choice foods at their choicest—flavor-fast in **PLIOFILM!** Goodyear, Chemical Products Division, Pliofilm Dept., Akron 16, Ohio.

Pliofilm

A PRODUCT OF GOODYEAR RESEARCH

GOODYEAR
THE GREATEST NAME IN RUBBER

Pliofilm—T.M. The Goodyear Tire & Rubber Company

Repeat sales start here

No matter what you're packing, your product goes on trial the moment the package is uncorked. If the cork comes out easily, in one piece, your customer gets a first impression of quality . . . an impression that can favorably affect his judgment of the product itself.

But if your cork is difficult to remove, your customer gets an *unfavorable* first impression. And this can adversely affect his judgment of your product, especially if he's using it for the first time.

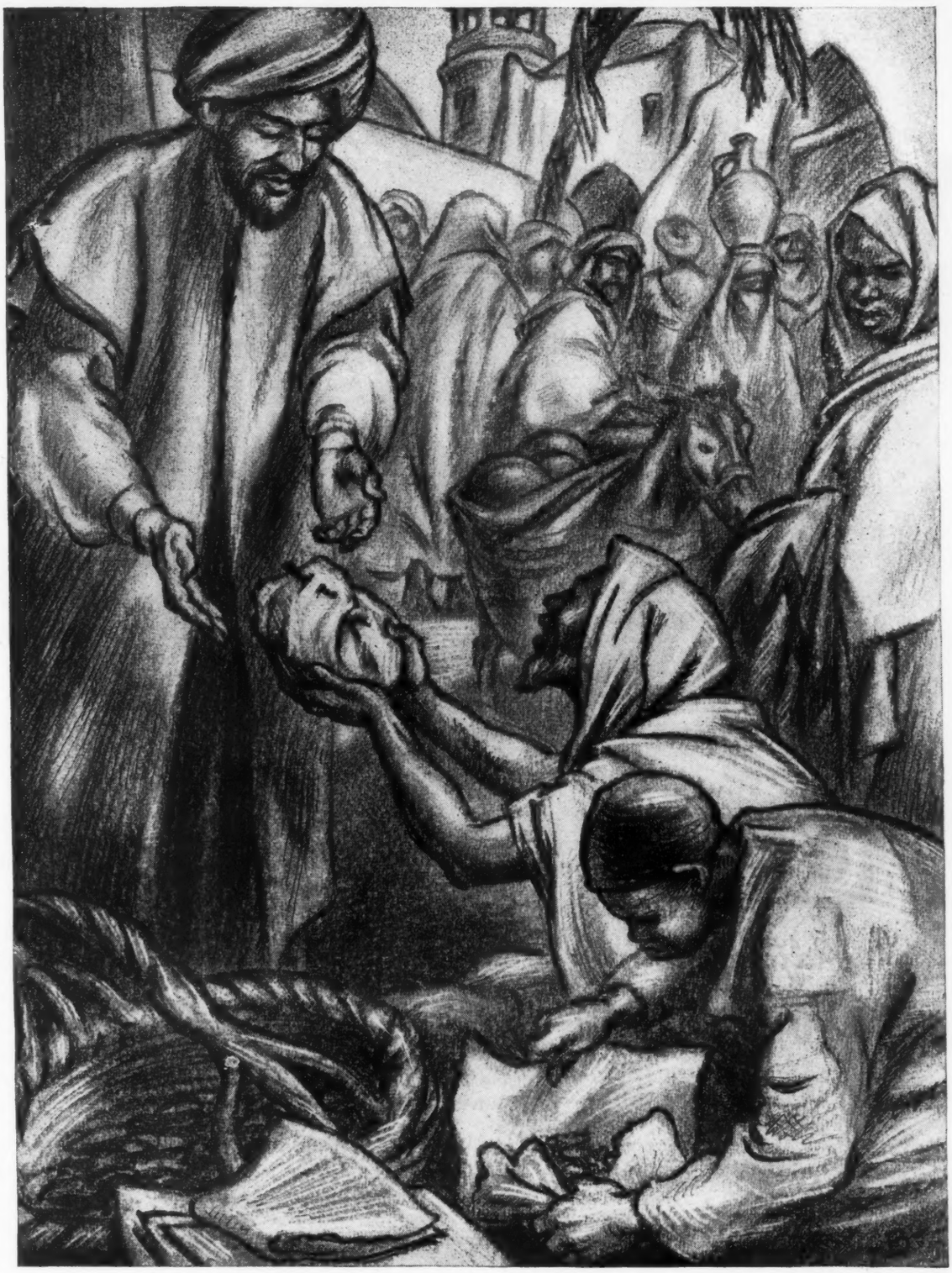
To make sure that your corks make only *favorable* first impressions, order them from Armstrong. Here you are sure of getting only top-quality corks—corks that draw easily—corks that say "quality" as well as seal your package securely.

For information about Armstrong's Corks—straight, tapered, shell, flange, or Embossed-Top—or any of the many other Armstrong Closures, get in touch with your nearest Armstrong representative. Or write to Armstrong Cork Co., Glass and Closure Division, 5905 Prince Street, Lancaster, Pennsylvania.

For favorable "first impressions"

ARMSTRONG'S CORKS and CAPS

THIS IS NUMBER FIVE IN A SERIES ILLUSTRATING THE HISTORY OF PAPERBOARD AND FOLDING CARTONS



PAPER GRADUATES TO PACKAGING

Paper as a packaging material was probably not used before the 11th Century. Prior to that it only served as a substance for writing. In 1035, Khorsan, a Persian traveler, reported that Arab merchants in Cairo were using sheets of paper to wrap up their wares. This is the first known use of paper as a packaging material. Although paperboard was known at that time, hundreds of years passed before it was used for packaging. And not until 1850 did folding cartons begin to revolutionize packaging and merchandising methods.

UNITED PAPERBOARD COMPANY, INC.
PAPERBOARD FOLDING CARTONS
285 MADISON AVENUE NEW YORK 17, N. Y.

50% More Production with CECO *Adjustable* CARTON SEALERS

Model A 3901-12

CECO

Adjustable

CARTON SEALER

Martinson's Coffee is one of the many well-known quality products protected in cartons sealed with Ceco Adjustable Glue Sealing Machines.

When container restrictions necessitated the adoption of the Martinson Victory Package, Ceco Carton Sealers solved the problem of producing tightly sealed, pilfer-proof, eye-appealing cartons at low cost. In Mr. Martinson's own words,

"We are pleased to report that our production has increased fifty percent since we installed two of your Ceco Adjustable Carton Glue Sealing Machines."

A Ceco Carton Sealer is easily adjustable without tools by an inexperienced operator for a wide variety of carton sizes. It seals and squares-up both ends simultaneously at speeds adjustable up to 120 per minute. This simple, portable machine will quickly repay its low initial cost. Write for details.

CONTAINER EQUIPMENT CORPORATION

Packaging Machinery Specialists

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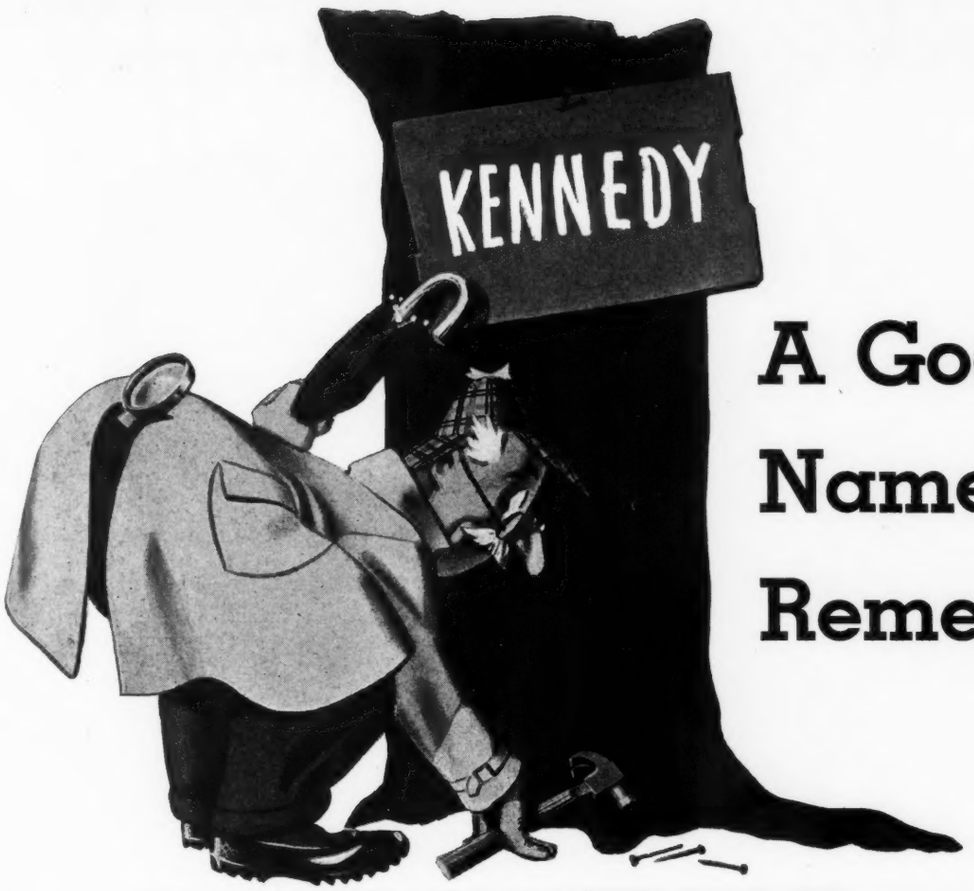
CHICAGO • TORONTO • BALTIMORE • ST. LOUIS

SAN FRANCISCO • ROCHESTER



A Good Name To Remember

FOR ALL TYPES OF PROTECTIVE PACKAGING

● Kennedy is one of the old-time names in the packaging business. It's a name people have had confidence in since 1901.

Just in case you don't already know it, Kennedy specializes in making prefabricated protective packaging for virtually all types of products—everything from perishable foodstuffs, delicate fabrics and precision instruments on up to completely assembled airplanes and trucks. So it doesn't make much difference how small or large your product is. If it requires protective packaging, Kennedy can furnish it.

Maybe your product needs protection against dirt, dust, water, moisture, vapor or air. Or maybe you only want to protect it against scuffs and scratches. It is all the same to Kennedy—because Kennedy works with practically every proved type of protective material . . . Waterproof Papers—Kraft Papers, plain and waxed—Pliofilm—Saran—Vinyls—Metal Foil—Cellophane. Kennedy's one and only interest is to select the material that will give your product the kind of protection it needs, and then to fabricate it—*at a price you can afford to pay.*

For the best in protective packaging—at sensible low prices—Kennedy's always a good name to remember.

KENNEDY CAR LINER & BAG CO. • SHELBYVILLE, INDIANA

Canadian Plant: Woodstock, Ontario • Sales Offices: New York, Philadelphia, Chicago, Cleveland, Detroit, Kansas City, Los Angeles, Atlanta

FABRICATORS IN WATERPROOF PAPER · KRAFT PAPER
PLIOFILM · SARAN · VINYLS · METAL FOIL · CELLOPHANES

PACKAGING PIONEERS Kennedy

The packaging that attracts . . .

And time has proven the sure-fire attraction of ACE Cartons. For back of these creations that help sell the nation's leading products, is inspired craftsmanship and a practical planning that goes beyond mere protection. It will be to your advantage to go over your packaging problems with our design engineers.

ACE CARTON CORPORATION

5800 West 51st Street, Chicago 38, Illinois

FOLDING PAPER CARTONS · FOLDING DISPLAYS · DISPLAY CONTAINERS

ACE CARTON CORP. ACE CHICAGO Creators

Do you need a custom-made coating?

A ready-made coating cannot always solve *all* your coating problems. It may do *part* of the job you want, but not necessarily the complete job. Make sure your coating will have the qualities you need by having it *custom-made*.

SYNTRON Coatings can be made to your specifications. Here is how the Gordon-Lacey research laboratories tackle your particular coating problems. *First*, they determine your individual requirements. *Second*, they develop a SYNTRON coating to meet your specific requirements.

SYNTRON *custom-made* coatings can be formulated for application to both porous and non-porous surfaces, such as fabric, paper, wood, plastic, nylon, metal, etc., and to impart such qualities as moisture vapor proof protection; resistance to grease and oil; heat sealing; toughness; resistance to acids, alkalis and chemicals; durability; abrasion-resistance, etc.

IF YOU DON'T NEED A CUSTOM-MADE COATING, SYNTRON OFFERS MOISTURE VAPOR PROOF HEAT-SEAL COATINGS

Ideal for all types of paper bags and packages, especially glassine. Non-toxic, odorless, oil and grease resistant. 1 to 5 grams moisture vapor per 24 hours per square meter. Block—above 135° fahrenheit under 1 lb. pressure per square inch.

ALUMINUM HEAT-SEAL COATINGS

Specially developed to give maximum sealing strength for all types of aluminum foil bags and packages. Actually sets up a solid barrier between the contents and attacking atmosphere. Waterproof; non-toxic; colorless; odorless; oil, acid and alcohol resistant. Block—above 135° fahrenheit under 1 lb. pressure per square inch.

HIGH GLOSS COATINGS

Protective coatings that give a very high gloss to all kinds of papers, eliminating the need for laminated cellophane or for wrapping packages in cellophane to give them protection and sparkling attractiveness. Alcohol-proof; grease, oil, acid and alkali resistant; and heat sealable.

*TRADE MARK

Write for full information concerning your coating problem to Dept. MPA.

GORDON-LACEY CHEMICAL PRODUCTS CO.

57 02 48th STREET • MASPETH, NEW YORK

these are the bottles

this the machine

Together they work like a charm. MRM solves your production problems for any size or shape of container from an OUNCE to a GALLON... or any viscosity of liquid. ● Nationally known packagers in ever increasing numbers use MRM's new dripless filling machine and equipment. And they take advantage of its simple sturdy steel construction for heavy use and simpler operations. ● Your special problem is ours. MRM will custom build its machine to your specific needs. It's easily adaptable to any set of filling procedures and ready for a five-minute changeover from one size to another. ● Drop in and see us... and prove to yourself that we lead the field. Comparison will prove our quality. There is absolutely no obligation for our demonstrations.

MRM company

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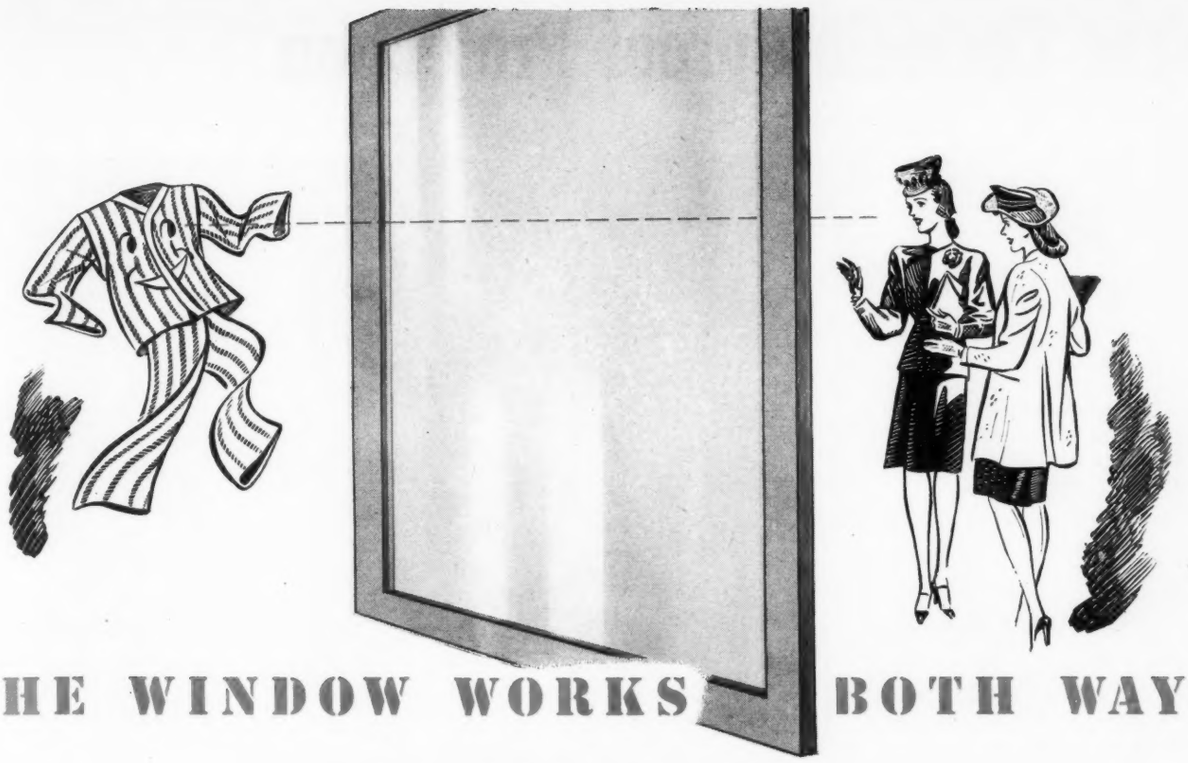
designers and manufacturers



THE WINDOW WORKS BOTH WAYS

THE PRODUCT LOOKS OUT...
THE PROSPECT LOOKS IN...

and **LAMCOTE**

GLAMORIZES PACKAGE AND MERCHANDISE

Enriched by the gleaming protection of the Lamcote window, the product displays its own selling lure. Customers look in and say, "I want this!"

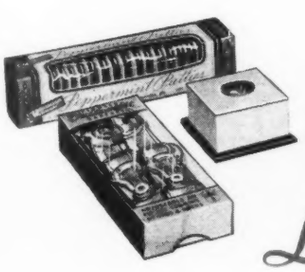
Combine two strong selling devices — beautiful packaging and self-display. Add Lamcote's lustrous, protective covering. It enriches the finest work of printer and lithographer. Adds new elegance and class appeal. Irresistible! A proven, low-cost stimulant to sales of every product.

SEND FOR DETAILS ON THE LAMCOTE PROCESS TODAY

LAMCOTE is the PROCESS

of permanently affixing a lustrous transparent, tough film of plastic to the surface of paper, cardboard, fabric or other material.

Point-of-purchase advertising displays, direct mail, catalogs, book covers, die-cut novelties, box-wraps, fabrics and specialties, all look richer—withstand handling—resist soil and wear longer.



METAL
PAPERBOARD
PLASTIC

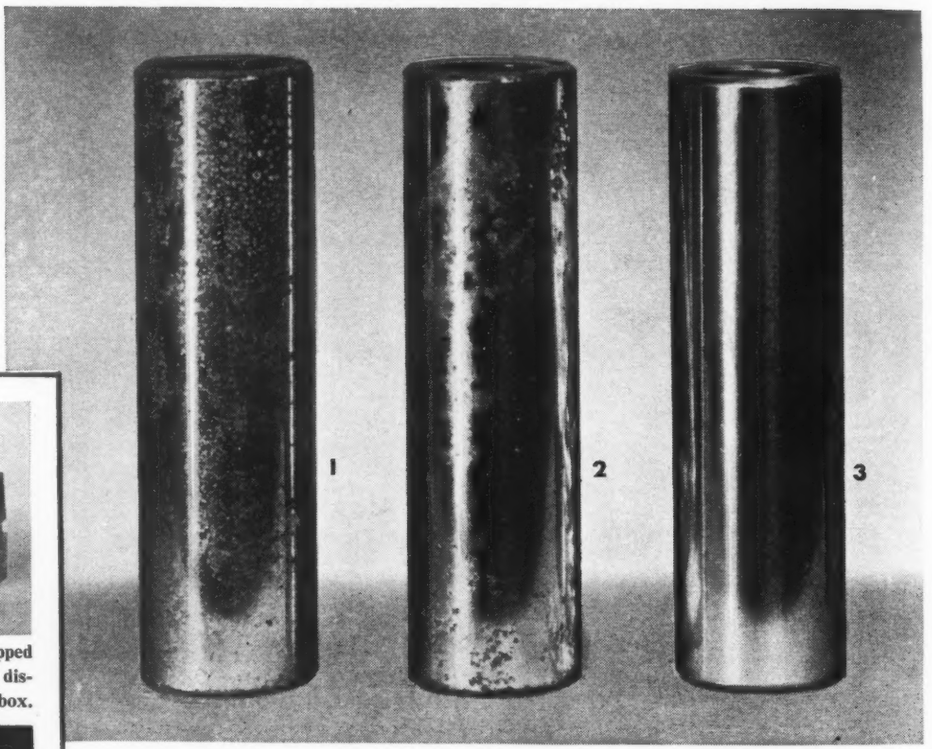
ARVEY CORPORATION

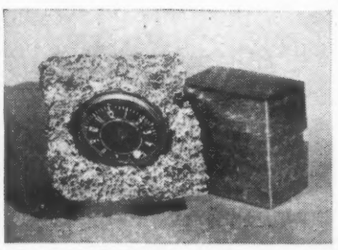
CHICAGO • JERSEY CITY

Lamcote REFLECTS THE QUALITY OF QUALITY PRODUCTS

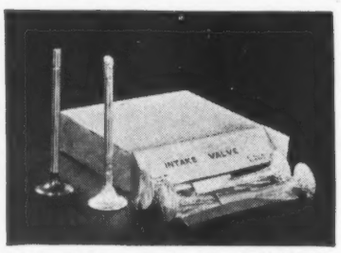
New Corrosion-proof Protection

Three Piston Pins were subjected to the same test: a 100-hour humidity test with 100 per cent humidity at 95° F. *No. 1*, unwrapped with no preservative showed considerable rust after 25 hours. *No. 2*, dipped in AXS-674, a light oil with rust inhibitor showed slight traces of rust after 25 hours. *No. 3*, after dipping in AXS-674 and *wrapping in Reynolds Aluminum Foil*, showed no signs of rust even after 100 hours.

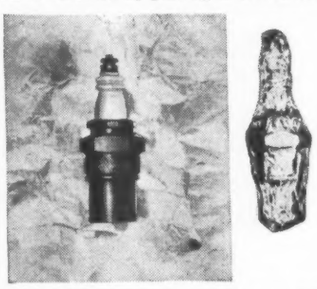




Electrical Automobile Clock—Wrapped in corrosion-proof aluminum foil and displayed in attractive embossed foil box.



Intake Valves—Each valve individually wrapped in aluminum foil. Extra display value obtained by placing in foil carton.



Spark Plugs—Aluminum foil, as an intimate wrap, safeguards against corrosion ...adds "buy" appeal.

plus sparkling sales allure

HERE is a revolutionary new method of packaging, developed to safeguard metal parts sent overseas under severe moisture conditions. Today this same method of packaging brings greater protection than ever before to countless civilian products...spark plugs—piston rings—bearings—valves...and many other metal parts.

Greater display value

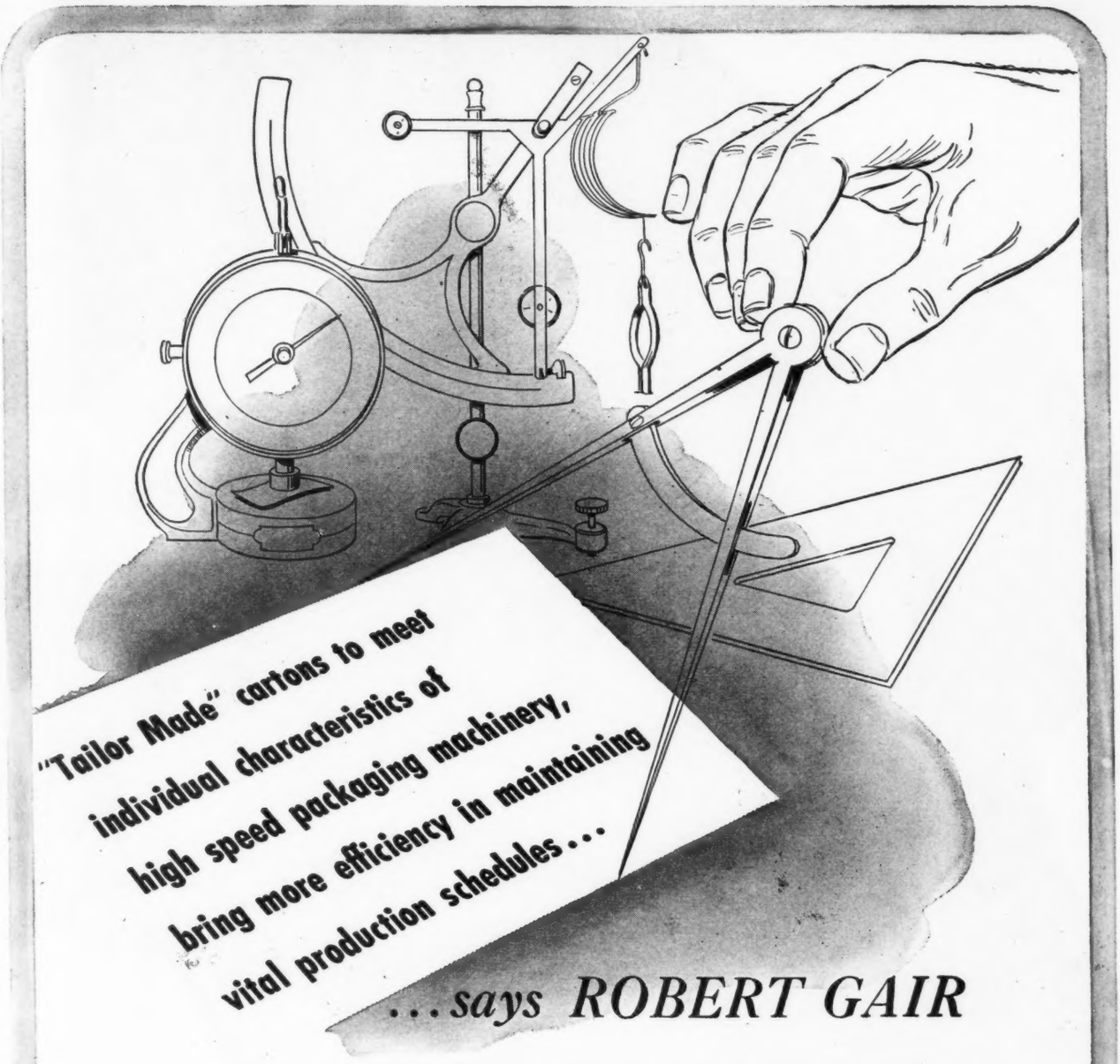
Reynolds Aluminum Foil used for packaging, adds a gleaming luster to the product that enhances sales appeal...brightens stock on display...makes for greater sales and faster turnover. Perhaps your product can benefit from the new advances made in packaging metal parts.

For complete, up-to-the-minute data on the many new uses for aluminum foil, write to the Reynolds Metals Company, Richmond 19, Virginia.

REYNOLDS ALUMINUM

REYNOLDS METALS COMPANY

Leads the way in Foil Packaging


"Tailor Made" cartons to meet
individual characteristics of
high speed packaging machinery,
bring more efficiency in maintaining
vital production schedules...

...says *ROBERT GAIR*

Each type of high speed packaging machinery has a "personality" of its own... a characteristic that demands the uniform precision of a "tailor made" carton... just the kind of distinctive "tailor made" cartons that embody the experience, the "know how" and the infinite care of the Robert Gair organization.

Our technical staff is at your service when you contemplate an improvement in your packaging facilities or when you plan the ideal carton for your new product.

Write for booklet on Precision Packaging

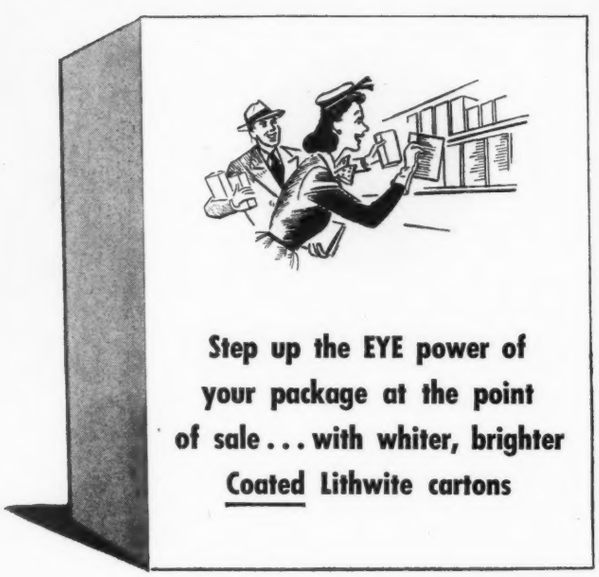
ROBERT GAIR COMPANY, INC. • NEW YORK • TORONTO

Paperboard • Folding Cartons • Shipping Containers

Her eyes have

to make the first move . . .

IF HER HANDS ARE TO REACH FOR YOUR PRODUCT



IN TODAY'S OPEN DISPLAYS, "eye power" in a package really counts—and *Coated* Lithwite cartons do have eye power. That's why you'll find so many leading products in *Coated* Lithwite cartons. Famous *Coated* Lithwite paperboard is smooth, velvety. Its chalk-free surface is a perfect base for printing inks. Reproduces pictures with true-to-life realism.

Made by a revolutionary new process, *Coated* Lithwite is the amazing paperboard that is formed, made and coated in one high-speed operation. Proved and improved for seven years.

Fewer "jammers" and "leakers." *Coated* Lithwite folds without flaking or shattering. Takes a tight positive seal. Production of *Coated* Lithwite cartons is currently sold up. But get full facts about *Coated* Lithwite cartons now. Ask a Gardner-Richardson sales representative to call.

More eyes reach for your product in . . .

Coated Lithwite Cartons

The GARDNER-RICHARDSON Co. • Manufacturers of Folding Cartons and Boxboard • Middletown, Ohio

Sales Representatives in Principal Cities: PHILADELPHIA • CLEVELAND • CHICAGO • ST. LOUIS • NEW YORK • BOSTON • PITTSBURGH • DETROIT

THE SIMPLE VIRTUES

FOR over three centuries, superior watches have been produced in Switzerland. The first Swiss watches were made by individuals in their homes. In later years they have been produced in factories by carefully controlled methods.

The exceptional quality of Swiss watches has always resulted from the simple virtues . . . honest work well done, with painstaking attention to detail . . . and refusal to compromise with quality.

These same virtues are factors which have always played an important part in the manufacture of Carr-Lowrey glass containers. Our aim is not to make the most . . . but the very best glass containers available to modern packagers. Strict adherence to this idea for more than half a century has won for us the confidence of a majority of discriminating buyers.

CARR-LOWREY GLASS CO.

Factory and Main Office: BALTIMORE, MD. *New York Office:* 500 FIFTH AVE. *Chicago Office:* 1502 MERCHANDISE MART

OLD DOMINION approaches your packaging professionally: a complete service that analyzes your product and problems, and scientifically solves them — assuring you the right box for the job. Whether you require set-up, spiral wound, corrugated or folding boxes, our packages offer the best features for shipping, safety, and selling. Old Dominion's forty years of experience, product research, and an able engineering staff, plus nine plants strategically located, are at your service.

OLD DOMINION *Box Company Inc.*

CHARLOTTE • N. CAROLINA

PLANTS LOCATED THROUGH THE SOUTH
NEW YORK REPRESENTATIVE
228 EAST 46th ST., NEW YORK 17, N. Y.

PRECISION BUILT PAPER BOXES AND PACKAGING MATERIAL

Here's looking at you, Helena Rubinstein!

Do you want more possessive eyes focused on your product? A Shaw-Randall acetate package keeps them looking at you.

This new visible three-unit package by Shaw-Randall puts Rubinstein's "Heavenly Glow" products in full view no matter which way you look at them. The top displays the powder; the bottom displays the lipstick and nail polish.

SHAW-RANDALL CO.

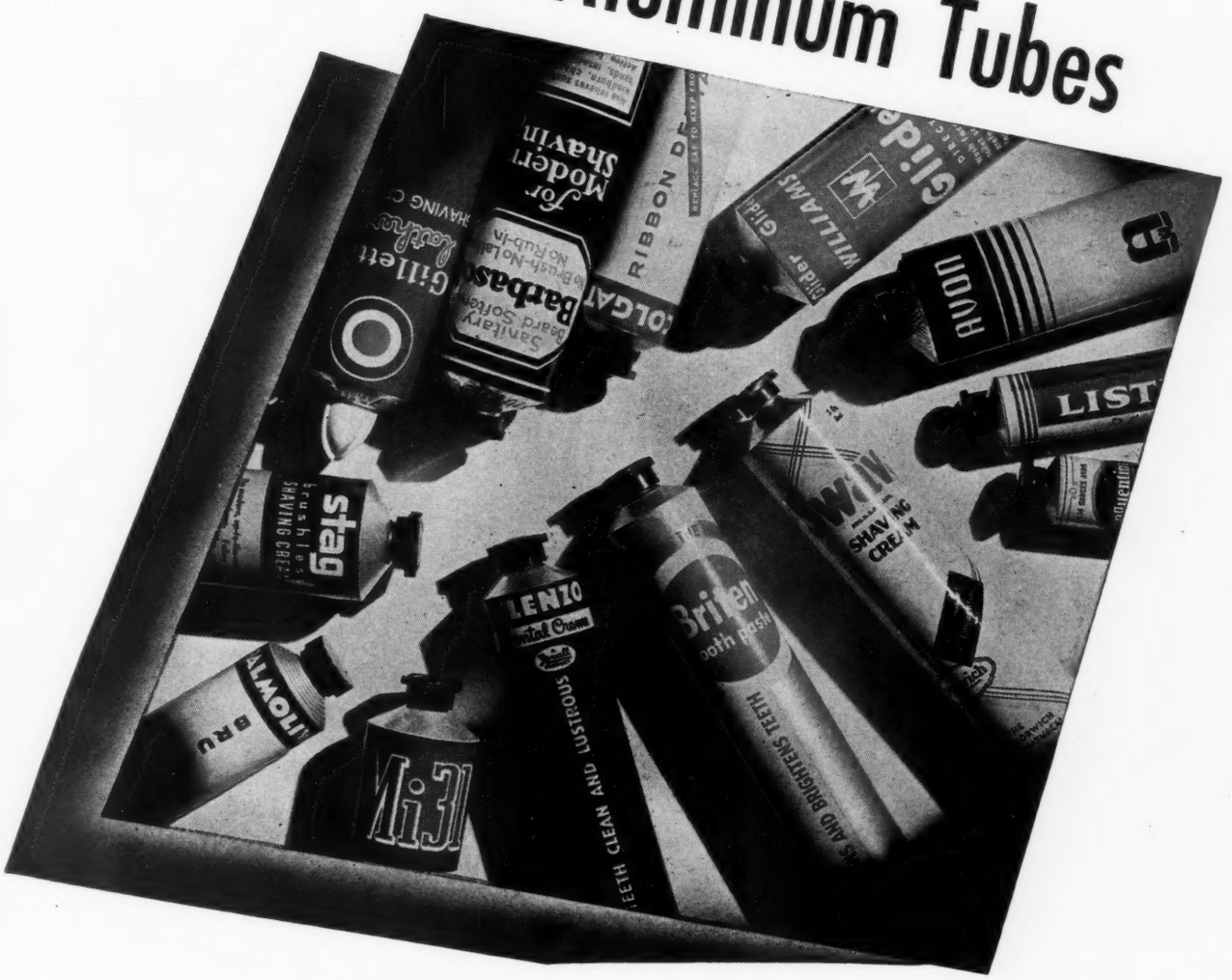
DESIGNERS and CREATORS of VISIBLE PACKAGES

PAWTUCKET • RHODE ISLAND

A DIVISION OF SHAW PAPER BOX COMPANY

NEW YORK REPRESENTATIVE: FRED MANN & CO. · 545 FIFTH AVENUE

When good products get together, you'll find Alcoa Aluminum Tubes



You *may* be impressed by the names on the Alcoa Aluminum Tubes shown above. They're good names. Or you may say, "So what? So's mine!"

In any case, you should be interested in knowing *why* so many good products . . . well-known tooth pastes, shaving creams (both brushless and lather), cosmetic creams, and pharmaceuticals . . . are packed in Alcoa Tubes. There are five reasons:

Purity is one. Practically any product can be packed safely in either a plain or inside-coated aluminum tube.

Strength is another. Alcoa Aluminum Tubes have sturdy shoulders and sound walls, good to the last squeeze.

Beauty is important, too. Clear colors and crisp details make Alcoa Tubes stand out in eye-appeal.

Then there's *lightness*. Shipping costs are materially lower for light aluminum tubes. That saves money. AND then there's *low cost*.

Consult the nearest Alcoa sales office or write ALUMINUM COMPANY OF AMERICA, 2129 Gulf Bldg., Pittsburgh 19, Pennsylvania.

ALCOA FIRST IN **ALUMINUM**

ALCOA ALUMINUM

Ship products in bulk and save on lower custom and freight tariffs.

New containers designed to your specifications.

Every Rowe Package embodies product protection, sales appeal, consumer utility and cost limitation.

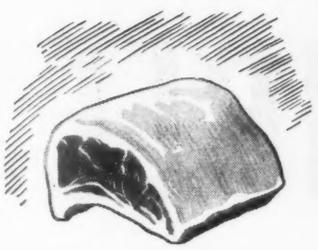
Your inquiries invited.

A *Complete* PACKAGING SERVICE

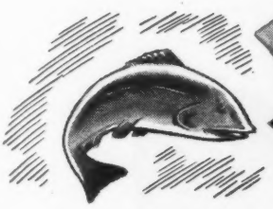
ROWE

ROWE PACKAGING CO., LIMITED – TORONTO, CANADA

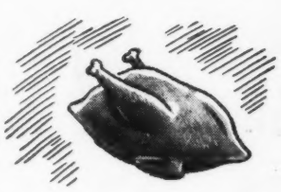
Proved uses for K-D papers



PORK LOIN



FISH FILLETS



QUICK FROZEN CHICKEN

FRUITS — VEGETABLES

MOISTURE VAPOR TRANSMISSION can be slashed to 1.3 grams with K-D functional packaging papers.

● **2 Types of Protection**—In packaged meats, vegetables and fruits moisture is held *in* . . . minimizing weight loss, maintaining bloom and flavor. For other uses, it keeps moisture *out*, preventing rust, corrosion or spoilage.

● **Lightproof—Greaseproof**—K-D functional packaging papers are heat sealable . . . available plain or with a lightproof aluminum foil lamination. Both are greaseproof, flexible over a wide range of temperatures.

● **Test Them Yourself—Send Coupon!** The coupon below will bring you samples of both types of K-D functional packaging paper. Send it today and test the samples . . . prove to yourself that these papers will meet your own particular needs.

KELLER-DORIAN
CORPORATION
Empire State Building New York 1, N.Y.

FUNCTIONAL PACKAGING PAPERS for Protecting Perishable Products

KELLER-DORIAN CORPORATION
Empire State Bldg., New York 1, N. Y.

Gentlemen:

Kindly send me samples of both types of K-D functional packaging papers for testing purposes.

Name.....

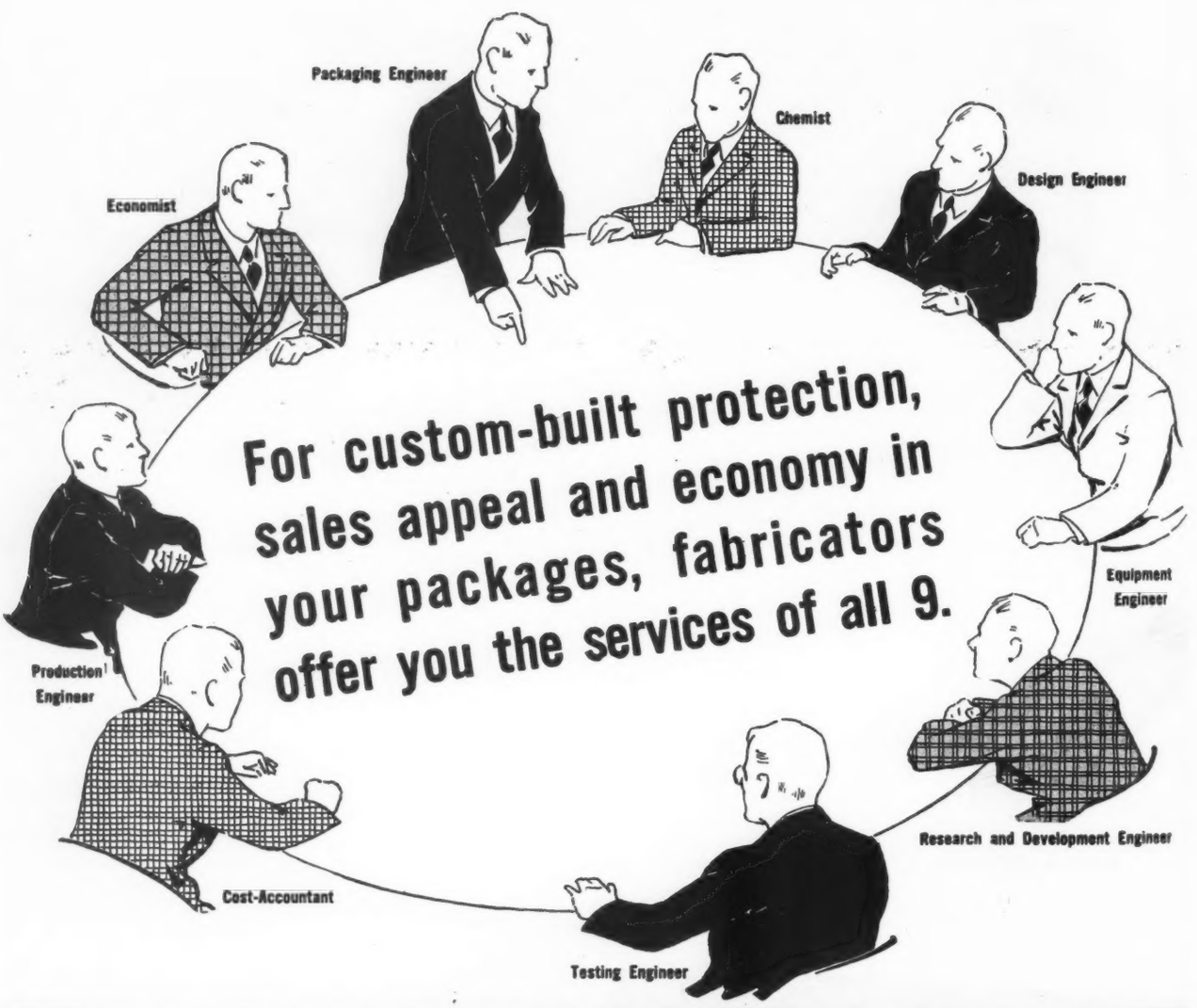
Company.....

Address.....

City..... *State*.....

The "know-how" of 9 specialists

FLEXIBLE



For custom-built protection, sales appeal and economy in your packages, fabricators offer you the services of all 9.

available to you when you specify

PACKAGING

MEMBER
FLEXIBLE · PACKAGING · INSTITUTE
fpi

"CAN you give me a package that acts as a moisture-vapor barrier?"

"Will your package maintain the vitamin potency of my product?"

"How can I get more shelf-appeal for my product?"

"Can you give me a package that will reduce transportation costs?"

These are typical questions put to us as fabricators. *Every manufacturer* is looking for adequate protection for his product, high shelf prominence and brand recognition, ease of use, and over-all economy.

That's why, when you buy flexible packaging, you get the services of 9 specialists to help you solve all phases of packaging.

These specialists know the right materials or the right combinations of materials to use. They are free to custom-build your package to meet your most complex need.

If you have a new product that requires a package, or if you have a packaging problem that has not been satisfactorily solved, put these experts to work for you. Simply write to the address below.

FLEXIBLE PACKAGING INSTITUTE
369 Lexington Avenue » » » » New York 17, N. Y.

Allied Paper Bag Corporation, Baltimore, Md.
American Bag & Paper Co., Philadelphia, Pa.
The American Paper Goods Company, Kensington, Conn. and Chicago, Ill.
Arkell & Smiths, New York, N. Y.
Arlette, Inc., Bloomfield, N. J.
Beier & Company, Chicago, Ill.
Bemis Bros. Bag Co., Indianapolis, Ind.
Benj. C. Betner Co., Devon, Pa.
Alfred Bleyer & Co., Brooklyn, N. Y.
Brown Paper Goods Co., Chicago, Ill.
Capital Envelope Co., Ltd., Los Angeles, Calif.
Central States Paper & Bag Co., St. Louis, Mo.
Central Waxed Paper Company, Chicago, Ill.
Cupples-Hesse Corporation, St. Louis, Missouri
Custom-Made Paper Bag Co., Long Island City, N.Y.
Diaphane Bag Corporation, Philadelphia, Pa.
Dixie Wax Paper Co., Memphis, Tenn. and Dallas, Texas
The Jaite Company, Jaite, Ohio
Kehr Paper Products Co., Philadelphia, Pa.
Kellogg Container Division, United States Envelope Co., Springfield, Mass.
Kennedy Car Liner and Bag Company, Inc., Shelbyville, Ind.
Marathon Corporation, Menasha, Wis.
Mehl Manufacturing Company, Cincinnati, Ohio
Monoca Bag & Mfg. Co., Inc., Toledo, Ohio
Moser Bag & Paper Company, Cleveland, Ohio
Oneida Paper Products, Inc., New York, N. Y.
Orchard Paper Company, St. Louis, Mo.
Paramount Paper Products Co., Inc., Philadelphia, Pa.
Thomas M. Royal & Co., Philadelphia, Pa.
C. E. Stevens Bros. Inc., Baltimore, Md.
Union Bag & Paper Corporation, New York, N. Y.
Western Paper Converting Co., Salem, Oregon

ONE Z-I-P-P AND IT'S OPEN . . .

WITH Zip-Tape

It's *really* that easy! Try it yourself with a package of a leading brand of cigarettes . . . you'll see why buyers prefer the quick and simple ZIP-TAPE method . . . and why it brings repeat sales. ZIP-TAPE, in any desired color, transparent or opaque, adds sparkle to your package . . . and it can be printed or plain, as you wish. For cigarettes, ZIP-TAPE costs less than a penny per 100 packs . . . *one* pound contains a *mile* and a *half* of tape. A ZIP-TAPE attachment can be readily and economically installed on your existing wrapping equipment. We'll gladly show you how you can take advantage of ZIP-TAPE on your present or new packages. *The Dobeckmun Company, Cleveland 1, Ohio. Branches at Boston, Chicago, Cincinnati, Los Angeles, New York, Philadelphia, San Francisco and Seattle. Representatives everywhere.*

CONSIDER Zip-Tape* FOR CELLOPHANE-WRAPPED:

- Dried Fruits
- Baked Goods
- Chewing Gum
- Razor Blades
- Candy
- Stationery
- Decorative Wrappings
- Tobacco Products

*Trade-mark

DOBECKMUN

→ Self-selling packages in processed films and foils ←

KIMBLE NEUTRAGLAS CONTAINERS

BROTHERS UNDER THE SKIN . .

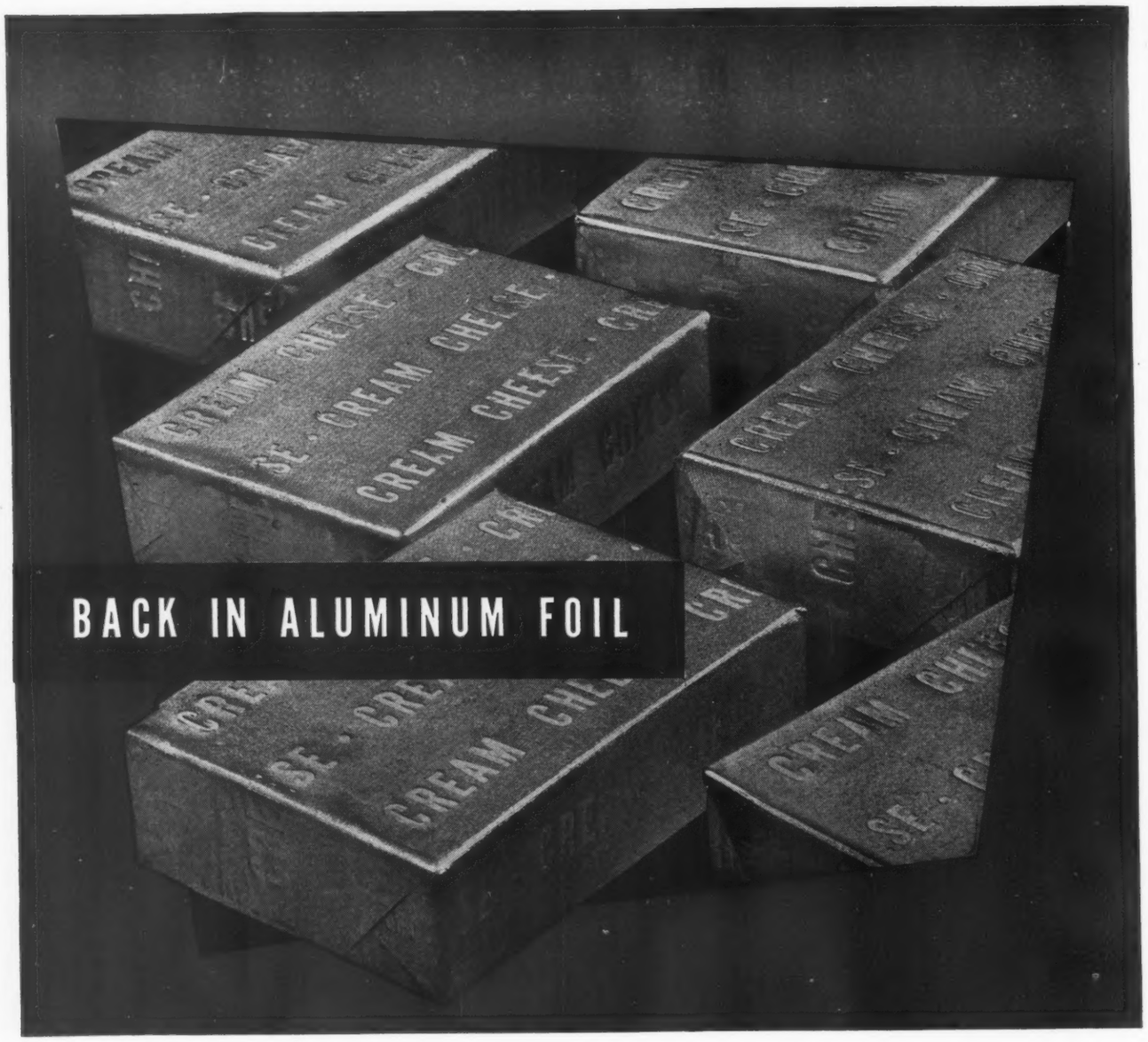
These three containers are all made of the same material — Kimble NEUTRAGLAS — a fact vitally important to users of molded bottles as containers for parenteral solutions.

Until Kimble's development of NEUTRAGLAS bottles, only serum vials and ampuls were available in glass of such high chemical resistance. Now Kimble offers molded glass containers of the *same high-resistance glass* (N-51A), assuring the same protection against corrosive and solvent action as the finest ampuls and serum vials.

For Assurance

• • • *The Visible Guarantee of Invisible Quality* • • •

KIMBLE GLASS COMPANY



Why? Because makers of cream cheese want their product to stay fresh. They have found from experience that there's no material equal to aluminum foil if you want . . .

TO PRESERVE GOODNESS

You get less moisture-vapor transfer. You get protection from light. You get protection from foreign odors and tastes. You get protection from oil and grease stains. AND . . . *you get a beautiful, sparkling package.*

TO PRESERVE GOODNESS . . .

Use Alcoa Aluminum Foil in *your* package. This can be done in many different and effective ways. Consult your package supplier on the best way of giving your product this better protection . . . in a carton, bag, packet, or wrapper.

For names of package suppliers experienced in producing Alcoa Aluminum Foil packages, call the nearest Alcoa sales office, or write ALUMINUM COMPANY OF AMERICA, 2129 Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA ALUMINUM FOIL

KIDDER POINTERS

No. 13.

Observations of trends and indications in packaging . . . noted by the manufacturers of Kidder "3 Point" Presses, Kidder Press Company, Inc., Dover, N. H.

Two new methods of food preserving: freeze-drying, developed from blood plasma preservation and electronic heat blanching. In the experimental stage, both show promise of wide application in the food industry.

New type plastic packaging materials may soon provide the American public with fresh fruits and vegetables in all seasons, at low costs, according to a report by Dr. R. P. Dinsmore of Goodyear Tire and Rubber Company — packagings varying from moisture-proof to moisture-emittant.

Bricks of orange juice are anticipated from Florida Agricultural Experiment Station's studies. Water is frozen out of juice, leaving a concentrate four times the juice strength and almost as full of vitamins and flavor as original juice. Concentrate can be frozen into soft bricks for storage at zero. Three parts of water added by the homemaker provides cold fresh juice tasting like the original.

New type aspirin tablet scheduled for market — of acetylsalicylic acid with vitamin K, the anti-hemorrhagic . . . for use by those having abnormal blood conditions in which coagulation is difficult.

A steady growth of impulse-buying is noted with more and more women making decisions at the point of sale. Surveys reveal that from 24% of volume in service stores up to 51% is now bought on impulse. This obviously puts a premium on appearance of merchandise and convenience of purchase. Packaging has been a necessary link in tying up the brand at the point of sale with advertising. A&P and others are experimenting with 100% self-service for fresh produce. Packaging is a "must" and specialists of the Cellophane Division of duPont are working closely with retailer, case manufacturer, boxboard supplier, machine manufacturer and State Agriculture Stations.

Patent 2390102, issued December 4, '45 (to Interchemical Corp., N.Y.) is for a typographic printing ink characterized by press stability under humid conditions, combined with ability to be set by addition of water to the film of ink.

Patent 2390390, issued December 4, '45 (to Interchemical Corp. N.Y.) is for a vehicle useful in the preparation of printing inks adapted to drying by heating films thereof to temperatures of the order of 200-240° F.

Cheese, dried fruits and other foods may be protected by a self-sterilizing wrapper with an inside coating of resin. The coating, developed at California Institute of Technology, can be used on metal foil, plastic films or paper, sterilizing the surface of the wrapper which touches food and setting up a germicidal barrier, says POPULAR MECHANICS, February '46.

Corrugated containers, folding cartons and paper cans are reported very tight in production again and present indications are a paper packaging war all over again, according to a report in GLASS PACKER for March '46.

Introduction of high frequency electronics creating heat within the mass of the product itself will speed up and improve processing of dried fruits and other packaged food products. Complete sterilization can be obtained while native flavor, mineral and vitamin content of foods are retained, according to Vincent C. Giordano, president, Clara-Val Packing Co. of Morgan Hill, California, which is making tests. Story in PACKAGING PARADE, February '46.

A cell-type box permits the first marketing of tree-ripened fruits to the consumer and you can see and read about it in MODERN PACKAGING, February '46, in an article by Dr. T. A. Merrill, Research Associate at Michigan State College.

KIDDER PRESS COMPANY, INC., ***Printing Machinery,*** **Dover, N. H.**

WRAPPER ACHIEVEMENT OF THE MONTH

A point-of-sale display that stimulates buying is achieved with this attention-getting bread wrapper, which is printed on one of Minerva Wax Paper Company's Kidder Rotary Presses. The neat three-color design is processed in crisp red, yellow and blue inks specially prepared to meet the customers' demand by Minerva on white opaque waxed paper. Clear-cut and attractive, this outstanding wrapper helps boost sales, in three states, of Toastmaster Bread, made by the Nickles Bakery Company, Navarre, Ohio. An additional widely-recognized advantage of the waxed paper wrapper is the protection it affords in maintaining oven-freshness of the bread to the consumer. For this colorful, sales-compelling wrapper, Kidder salutes

THE MINERVA WAX PAPER COMPANY
MINERVA, OHIO
"Protective Papers for Over 25 Years"
Minerva—Goddess of Hygiene

THREE METHODS . . . THREE CHARACTERISTICS FOR BETTER COLOR ACHIEVEMENTS

Promise Converters Quality Printing from Kidder "3 Point" Line

Roll-printing through letterpress, aniline and gravure, all available for fine color achievements through Kidder Presses, finds the well-known "3 Point" Kidder trademark emphasizing the importance of the three *characteristics* of quality printing. This Company identification also calls the attention of converters to the three *types* of Kidder presses.

KIDDER MULTI-COLOR PRESSES, used by about 90% of the country's bread wrapper converters.

ANILINE-TYPE PRESSES, known prewar as the "Aniliner" and now offering heavier presses for high-quality, high-speed runs . . . with the new narrow model "Celloprinter", primarily for cellophane.

GRAVURE PRESSES, labelled "Unitype" because units may be added as needs arise.

Also KIDDER SLITTERS and REWINDERS, offering new models for the converting field.

Kidder engineers with printing know-how are designing and building improved printing presses . . . and they're ready to consult with you on trends in packaging, inks and quality presswork or on the new high-speed slitters and rewinders.

CONTROL OVER THE PAPER

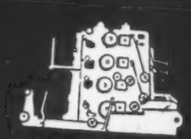
PROPER DISTRIBUTION OF INK

ACCURACY OF THE IMPRESSION

KIDDER
THREE POINT
PRESS

KIDDER

Manufacturer of "3 Point" Presses—so-called because they fulfill the three major requirements for perfect printing.

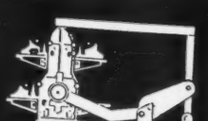


MULTI-COLOR LETTER PRESSES

for waxed paper, box wrappers, etc., rewound or sheet-delivered — up to 72 inches.

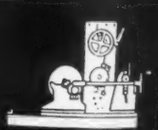
MULTI-COLOR "UNITYPE" GRAVURE PRESSES

for cellophane, foil, pliofilm, etc., — up to 36 inches.



"ANILINER" and "CELLOPRINTER" MULTI-COLOR PRESSES

for decorative papers, cellophane, glassine, etc., — up to 65 inches.



SLITTERS AND REWINDERS

for paper mills, finishing rooms and small-roll, high-speed slitting — up to 115 inches.

Self-Sealing Printed Tapes

for **LABELING,**
CODING,
IDENTIFICATION,
INSTRUCTIONS

Here is the easy, quick-action, sure-adhesion method of putting a label onto your product or package or shipping case. FILMONIZE Self-Sealing Printed Tapes can label stock parts, identify the various steps in a manufacturing process, advertise a finished product, give instructions as to how an armature or a radio set is wired. And these are only a few of the hundreds of ways in which leading industrial and commercial firms are putting these tapes to use.

Your message, trade name, or trade mark is accurately reproduced — in a wide choice of colors. The printing is under the surface — does not rub off. Your label is neat, lasting and attractive.

FILMONIZE Tapes may be cellulosic, paper or metal — and in all widths from ½ inch to 18 inches. They may be applied to any surface from a bar of steel to a waxed carton of frozen food. They seal without water — require no tying, no paste pot, no hot iron. They save man-hours.

We invite the opportunity to show you the wide variety of FILMONIZE Tapes — and to tell you of the exclusive, patented methods of precision manufacture by which they are produced. Wire or write us today!

Give your products a real sales punch with dependable A. P. G. Cellophane and Glassine Bags and Envelopes — hard-hitters which produce customer satisfaction . . . give that all-important "follow-through" which brings repeat sales . . . larger orders.

Packagers everywhere find that the attractive, eye-catching special designs and prints of A. P. G. products meet their requirements every time — provide their sales with that profitable, powerful punch!

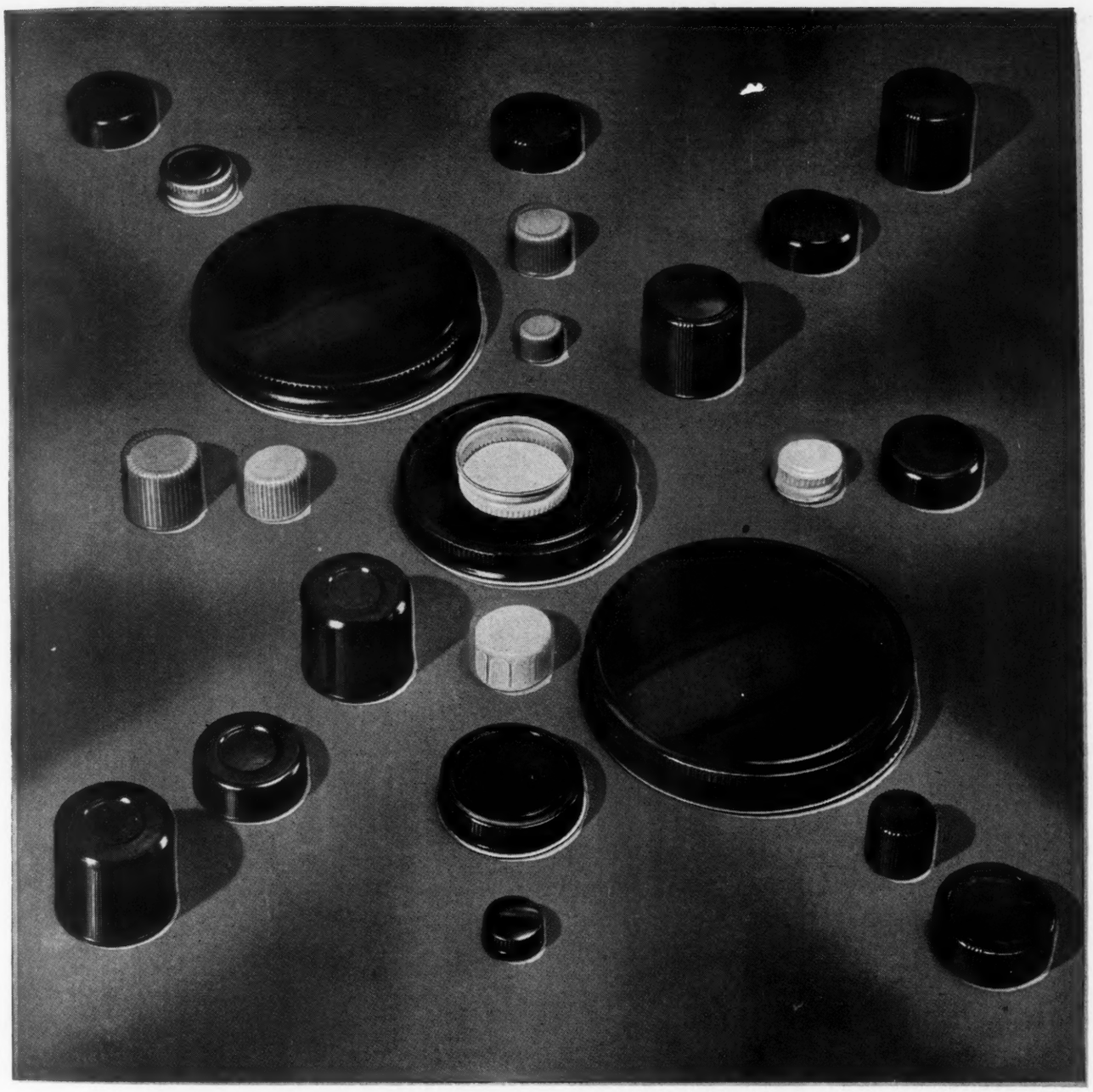
★ *Our staff includes competent representatives experienced in handling the difficult or unusual packaging problems. They'll be glad to assist you at all times.*

MEMBER FLEXIBLE · PACKAGING · INSTITUTE · fpi

The American Paper Goods Co. OVER 50 YEARS OF SERVICE

KENSINGTON, CONNECTICUT CHICAGO, ILLINOIS

Sales Offices — New York · Chicago · Boston · Philadelphia · Charlotte · Atlanta · Cincinnati · Minneapolis · Fort Worth · San Francisco · Seattle



A few of the many styles of plastic and metal closures now available to give a finishing touch to a good-looking package.

The Finishing Touch!

The right closure is vital to good packaging. From the wide range of closures—plastic and metal—made by Owens-Illinois—you can find the right one for your product.

Owens-Illinois produces plastic closures in conventional black and brown—and also very special pastels to distinguish cosmetic and allied packages in the competitive days ahead.

Owens-Illinois offers you a complete plastic and metal closure service—from the designing room to your package. Consult us about *your* particular closure requirements.

CLOSURE DIVISION

OWENS-ILLINOIS GLASS COMPANY

TOLEDO 1, OHIO • BRANCHES IN PRINCIPAL CITIES

Creative designing and restyling
Exclusively handmade boxes

by

MAKDON

in New York City

306 WEST 37th STREET • SINCE 1940

in Paris, France

STE ANONYME JACQUES MAKOWSKY
ATELIERS D'IMPRESSION ET DE CARTONNAGE D'ART
34 RUE DES PEUPLIERS • SINCE 1920

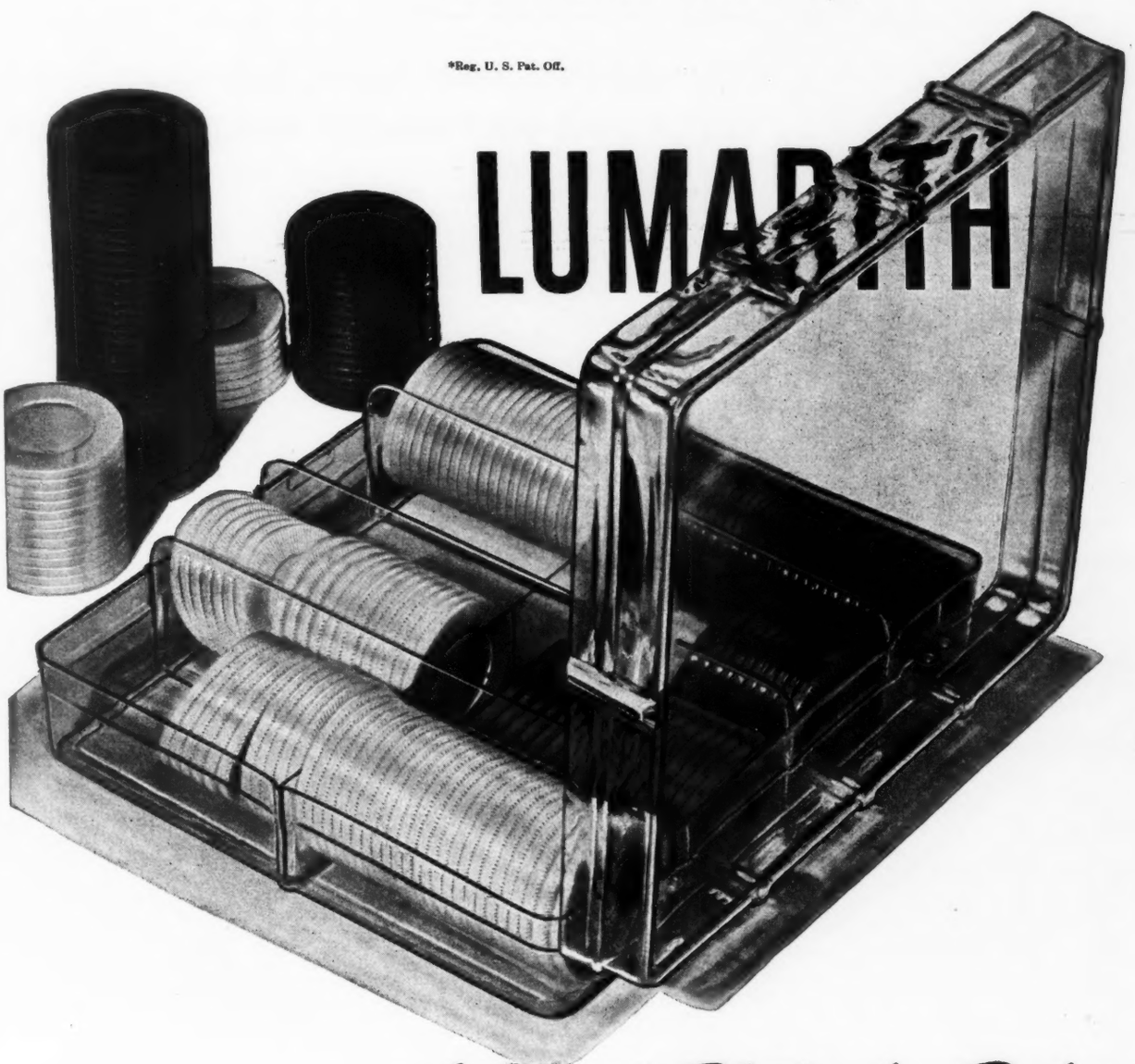
Formed

The formed transparent container made of Lumarith* plastic says flattering things about your product right in front of the shopper. Although moderate in cost, its sales influence is tremendous.

By incorporating transverse ribs into the container design, great rigidity can be obtained even with the thinner and more economical gauges of stock.

Sales influence is a quality of all Lumarith plastic packaging materials: transparent film for wraps, bags and laminated boxes . . . sheets for fabricated and formed containers . . . molding materials for esthetic and functional packaging applications. Write for the Celanese booklet "LUMARITH transparent FILM." Celanese Plastics Corporation, a division of Celanese Corporation of America, 180 Madison Avenue, New York 16, N. Y.

*Reg. U. S. Pat. Off.



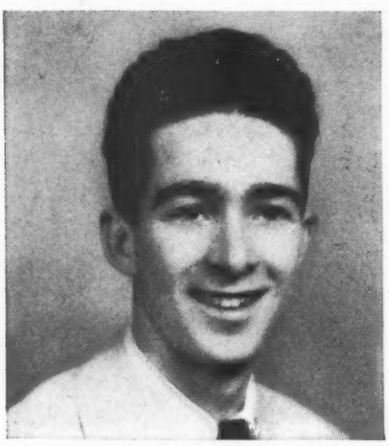
A Celanese Plastic for Packaging*

KEEPING IN TOUCH

PREPARED BY INTERNATIONAL PRINTING INK DIVISION OF INTERCHEMICAL CORPORATION • MAY, 1946

ipi

PRIZE WINNERS ANNOUNCED IN IPI TENTH ANNIVERSARY ESSAY CONTEST



RICHARD ORANSKY
Winner of the Tenth Anniversary Special Award

New Englander Takes Special Anniversary Award; Refugee Youth Also Places High Among 6,000 Entrants

Prize winners in the Tenth Annual Essay Contest, in which more than 6,000 students of printing in the United States and Canada competed, have just been announced by Fred Hartman, Educational Director of the National Graphic Arts Education Association, in cooperation with International Printing Ink, sponsors of these annual essay contests. Subject of the contest was, "Printing and World Peace".

Winner of the Tenth Anniversary Special Award was Richard Oransky, 18 year old senior of Portland High School, Portland, Me. A student of Industrial Arts he also is interested in radio and is already credited with 38 weeks of various teen-age news and variety shows broadcast by radio station WGAM.

First prize in the regular contest went to 17 year old Frank Brenner, of the New York School of Printing. Frank came to the United States via wartime England in 1943. At the age of ten Frank escaped from Nazi Germany to Great Britain where he experienced as many as twenty-one air raids in one day.

FRANK BRENNER

Canadian and Brooklyn Youths Each Take Two Prizes

Sidney G. Simpson, of the School of Graphic Arts in Montreal, Canada, whose essay placed second, also won first prize for producing the best printed entry. He intends to become a printer when his education is completed.

Third prize winner was Julius Kieves, 18 year old student at Brooklyn Technical High School. He, too, is a double winner. In addition to winning third prize he placed fifth in the competition for the best printed essay.

Julius intends to enter Cornell next fall to study electrical engineering.

Fourth prize went to Chandler R. Meloy of the John H. Francis Polytechnic High School, Los Angeles, California, and John Randolph of the Gerstmeyer Technical High School, Terre Haute, Indiana, was recipient of fifth prize. Five dollars in Savings Stamps was awarded to each of the 25 runners-up.

"Best Printed Essay" Awards

First prize for the Best Printed Essay went to Sidney G. Simpson, School of Graphic Arts, Montreal, Canada, second prize to Catherine Ross Sheppard, N. R. Crozier Technical High School, Dallas, third prize to Ernest Schiff, Murrell Dobbins Vocational School, Philadelphia, fourth prize to Barbara Dalton, J.C. Murphy Junior High School, Atlanta, and fifth prize to Julius Kieves, Brooklyn.

SIDNEY G. SIMPSON

Prominent Men Act as Judges

Serving for the tenth consecutive year as Chairman of the judging committee was Harry L. Gage, Vice President of the Mergenthaler Linotype Co. He was assisted by such outstanding men as C. R. Counquergood, President, Canada Printing Ink Company, Ltd.; Major George Fielding Eliot; W. E. Griswold, Executive Director, Lithographic Technical Foundation, Inc.; and Frederick J. Libby, Executive Secretary, National Council for Prevention of War.

Ohio School Wins Silver Cup

The Silver Cup for the school submitting the essay most attractively printed in color went to Timken Vocational High School, Canton, Ohio. Winner of the Silver Cup in previous contests, this school has usually placed high in all phases of the competitions.

FOR THE NEWEST IN INKS AND COLOR SERVICE—"KEEP IN TOUCH WITH I. P. I."

Your Fate Is In These Hands

WHEN your package is sealed with an Anchor Amerseal Cap you can be sure that the consumer's reaction will be favorable insofar as the sealing and convenience of the package is concerned. You can be sure that every one of your packages will open easily at the merest twist of the wrist and that the same simple, easy quarter turn will reseal them tightly and securely again.

The whole secret of the effectiveness as well as the convenience of the Anchor Amerseal Cap lies in its lug construction. Equally spaced lugs engage the under side of corresponding threads in the glass finish and draw the cap and liner down, effecting a tight uniform contact around the top edge of the container finish. Because the cap makes contact at only a few points around the container finish, and these on the under side of the glass threads, contact is easily broken and the cap removed with perfect ease.

Anchor
CONTAINERS and CAPS

Tune in ANCHOR HOCKING'S HOBBY LOBBY
CBS NETWORK . . . THURS. EVE.

PRODUCTS OF
ANCHOR HOCKING GLASS CORPORATION
LANCASTER, OHIO

Anchor Amerseal Cap

STANDARD-KNAPP

Engineers and Builders of Packaging Equipment

ANNOUNCE

the construction of a new plant to serve the packaging industries

Standard-Knapp case packers and case sealers, labelers and bag fillers are standard for top quality and performance in practically every field of packaging. One reason is that every machine is, in a very real sense, a custom-built job adapted to perform a special function for a special industry. Other reasons are: sound design, quality construction and long life performance which add up to low unit cost in packaging production.

STANDARD-KNAPP CORP.

MANUFACTURERS OF CASE SEALING, CASE PACKAGING AND CAN LABELING MACHINES

FACTORY and GENERAL OFFICES—PORTLAND, CONNECTICUT

570 Lexington Avenue, NEW YORK 22, N. Y. — 221 North LaSalle St., CHICAGO 1, ILL. — 145 Public Square, CLEVELAND 14, OHIO — 300 Seventh Street, SAN FRANCISCO 3, CALIF.

420 S. San Pedro Street, LOS ANGELES 13, CALIF. — 3224 Western Avenue, SEATTLE 99, WASH. — 1208 S. W. Yamhill Street, PORTLAND 5, OREGON — 349-350 Paul Brown Bldg., ST. LOUIS 1, MO.

Windsor House, Victoria Street, LONDON S.W. 1, ENGLAND

PAX TAPE QUALITY IS BETTER FOR BETTER PACKAGING

Packaging designers are partial to PAX TAPE because of its uniform dependability in the solution of many modern packaging problems.

PAX TAPE seals instantly without moistening. It sticks stronger, lasts longer.

Use PAX TAPE for permanent anchorage on "hard-to-seal" packages and containers; and for many types of protective wrapping. PAX TAPE smartens up the package while doing an effective utility job.

TRY PAX TAPE

The BETTER Tape

Transparent and in Colors

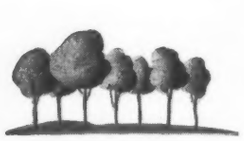
THE COFAX CORPORATION • Lynbrook, N. Y.

if you now wrap your product in paper

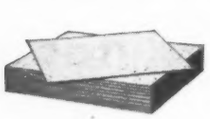
A bag may do your job better at lower cost

Yes, if you now wrap your product in paper, you may be wasting valuable time, material and labor in your packaging department that could be saved if you used *special paper bags*. The Bemis Paper Bag Specialty Division is giving manufacturers important savings by developing bags and methods of packing a wide range of products formerly hand-wrapped in paper.

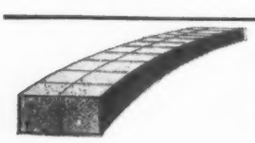
TREES • CANS • FIREBRICK AND PERHAPS YOUR PRODUCT



A waterproof paper bag saves time, materials and labor in wrapping trees. Trees ready for shipment are usually wrapped in paper. Now they may be slipped into special paper bags supplied by Bemis. Time and labor is saved, and the bag makes a better looking package.



4′ x 12′ sheets of wallboard are usually wrapped in heavy paper. A large paper bag has been designed to hold six sheets. This gives savings in labor and materials; frees valuable floor space in the packing department.



100-pound cubes of firebrick clay are unwieldy and hard to wrap in paper. A special paper bag speeds up handling and provides a more efficient protective covering.

SUBMIT YOUR PACKAGING PROBLEMS TO BEMIS

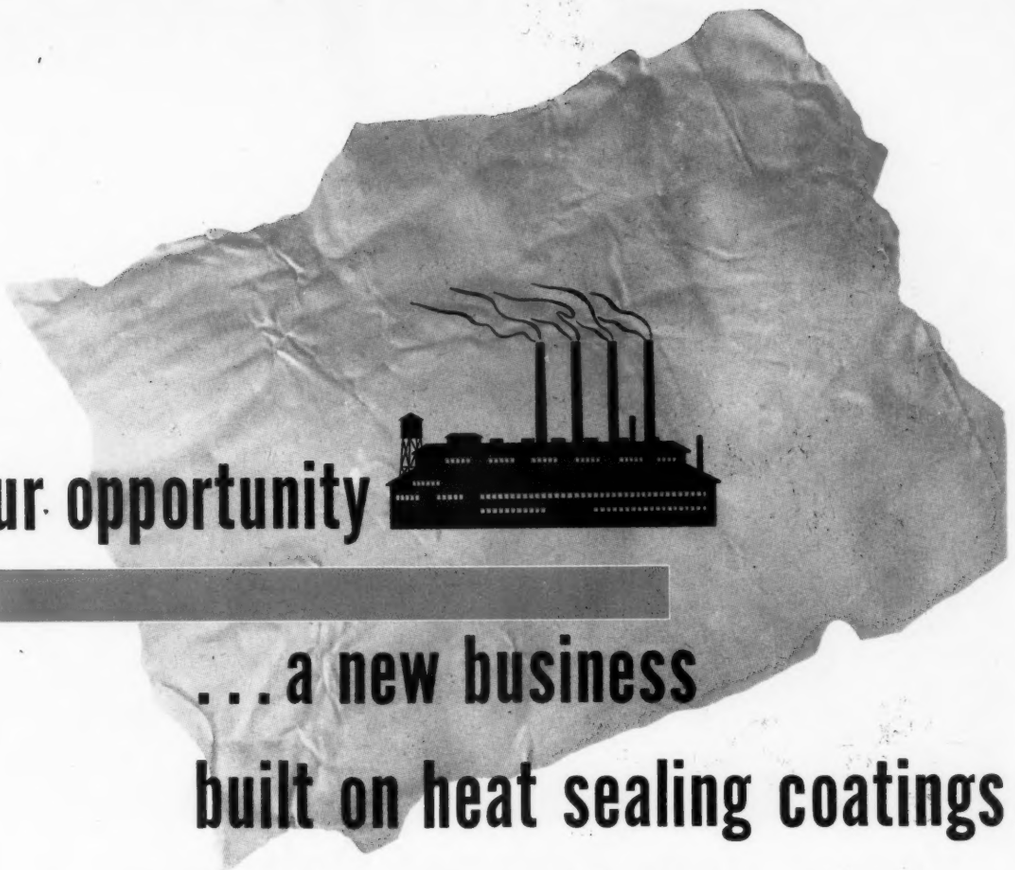
No matter what type or size of product you make, if you now hand-wrap in paper you may find new packaging economy in a *special paper bag*. Call Bemis today. There is no obligation.

BEMIS BRO. BAG CO.

BEMIS BRO. BAG COMPANY

PAPER BAG SPECIALITY DIVISION

1058 S. Vandeventer
St. Louis, Missouri



Is this your opportunity ...a new business built on heat sealing coatings for aluminum foil?

We predict that many enterprising manufacturers are going to convert this remarkable wartime development of moisture-proof packaging materials into new, profitable markets for themselves.

Think, for instance, what it means to be able to offer for the first time truly air-tight, watertight, vapor-tight packaging for such moisture-sensitive civilian goods as:

- Candy
- Cheese Foods
- Confections
- Dehydrated Soups, Puddings
- Dried Fruits, Vegetables
- Powdered Coffee
- Tobacco

Monsanto's claims for its heat sealing coatings for foil are based on demonstrations in the toughest packaging assignments of all time . . . war in the South Pacific. The coatings are colorless, and acid, alcohol and alkali resistant. They function as heat sealing coatings and also provide greater strength, improved pliability and appearance for the composite.

These coatings are now being supplied by Monsanto without restriction. Full technical information and samples . . . or practical advice from Monsanto's Packaging Department specialists . . . are all yours for the asking: MONSANTO CHEMICAL COMPANY, Plastics Division, Springfield 2, Massachusetts.

Coming your way from Monsanto, too:

Water emulsion coatings and adhesives

Synthetic resins for application to paper and paperboard for improved scuff resistance, water and moisture resistance.

VUE-PAK
TRANSPARENT PACKAGING MATERIAL
TRADE MARK

MONSANTO
PLASTICS
SERVING INDUSTRY...WHICH SERVES MANKIND

How a New Package Quit Being a Problem

(Let's listen in . . .)

". . . so, we need a strong airtight container that will resist dampness and give us good display value. This U.S.E. Analyzer chart narrows the choice to these materials. I have checked off several of their standard forms, any one of which I think might be used. We're digging into the matter further with them and expect to have some final recommendations for you by Wednesday."

• • • • •

Container problems may or may not be solved "as easy as that" — but you can cover a lot of preliminary ground in a few minutes with the U.S.E. Packaging Analyzer Chart (free). It analyzes a container problem in terms of basic product characteristics such as the need for protection from dust, air, light, moisture, oil, handling . . . and package features such as size, shape, flexibility, type of closure, degree of transparency, display values, etc. It changes a problem into a *project*, and prepares the way for precise and practical recommendations by U.S.E. Container Engineers.

Whether your product requires a tailor-made or standardized package, the Kellogg Container Division is ready to consult with you. As an important first step, write for a free copy of the U.S.E. Envelope Analyzer Kit. It contains the complete Packaging chart shown above, plus similar check lists covering Mailing and Business Systems.

P—147

UNITED STATES ENVELOPE COMPANY

14 Divisions from Coast to Coast

U·S·E PROTECTIVE PACKAGING

K KELLOGG CONTAINER DIVISION SPRINGFIELD MASS.

Made on precision-built machines, by one of the most modern plants in the world, Dominion Foils stand out with their flawless surface and high reflectivity. The manufacturers of Dominion Foils are equipped to produce aluminum and composition foils to your own rigid specifications.

PLAIN • COLORED • EMBOSSED
AVAILABLE IN SHEETS AND ROLLS FOR PROMPT DELIVERY

BULKLEY, DUNTON & CO., INC.
Specialty Division
295 MADISON AVE., NEW YORK 17, N. Y.
CHICAGO 16, 2635 South Wabash Avenue • LOS ANGELES 13, 124 West 4th Street

Do Your Products Have These
Selling Advantages
What other type of container combines so many desirable advantages as
Clearsite*
*Reg. U. S. Pat. Off.
Tops in appearance . . . Second to none in durability . . . lustrous transparency or colorfully opaque as befits the products or the preference of the sales-minded . . .
These CLEARSITE containers rank high in sales appeal, and afford production and shipping economies, too. CLEARSITE—made of Cellulose Acetate Safety Base!
They're
SHATTERPROOF • SEAMLESS
FEATHERLITE • COLORFUL and
IMPRINTED DURING MANUFACTURING PROCESS
Write for Samples . . .
Let Yourself Judge Their Merits
AR-EX
DICKSON
BINKY
TEETHING

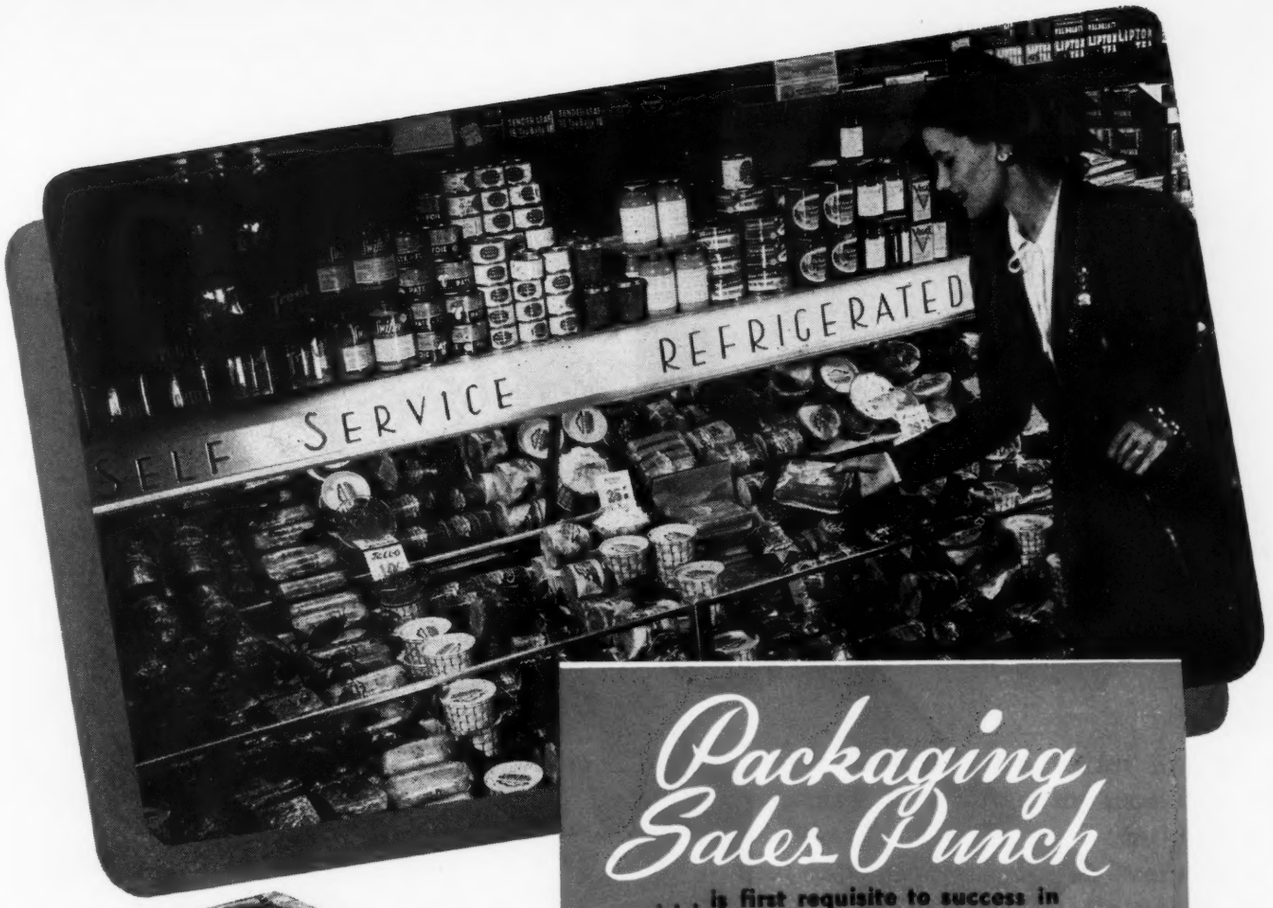
CELLUPLASTIC CORP.

CELLUPLASTIC CORPORATION

PLASTIC CONTAINERS
AND
PLASTIC PRODUCTS

40 AVENUE L NEWARK 5, N. J.

NEW YORK OFFICE—630 FIFTH AVENUE WEST COAST CONTAINER SERVICE COMPANY, LOS ANGELES 27 CAL.



Packaging Sales Punch

. . . is first requisite to success in the highly competitive market for

FROZEN FOODS!

● Does your present package protect the quality of your product—right into the hands of the consumer? Give appetite teasing display? Identify your brand? And—above all—does your package have all the sales punch you can possibly put into it? There's no need to guess! Traver engineers, technicians, sales-minded designers will analyze your package—offer recommendations —without any obligation to you!

All You Need Do Is

Mail Your Present Package to Us -Care Dept. MP 546

Traver **multi-printed cellophane packages get preferred dealer display! Ideal for *Frozen Fruits, Vegetables, Meats, Poultry, Fish*—or any frozen food product!**

Convertors of
CELLOPHANE, GLASSINE, FOILS, ACETATES, PEARLON PLASTIC FILMS, PROTECTIVE PAPERS

Traver CORPORATION

Offices in Principal Cities—Reply to Chicago
358-368 West Ontario St., Chicago 10, Illinois

Manufacturers of LOXTITE Partitions

PACKAGING THAT SELLS!

PLIABLE as the Rippling Muscles of the Racehorse..

Yet, "TOUGH AS NAILS"

Sheffalloy
TRADE MARK REGISTERED
SHEFFIELD PROCESS
TUBES

COLLAPSIBLE TUBES are subjected to a great deal of punishment..squeezing, bending, folding ..until the contents are used. That's why we build in a surplus reserve of strength in *"SHEFFALLOY" Sheffield Process Tubes.* The secret of their extra toughness lies in our *exclusive Sheffield Process* of mixing, melting, and tempering tube metal. If you would safeguard the quality, prestige and merchandising power of your product, specify these better tubes. Call or write our nearest office, now.

NEW ENGLAND COLLAPSIBLE TUBE CO.

3132 S. CANAL STREET, CHICAGO 16 • NEW LONDON, CONN. • W. K. SHEFFIELD, V. P. 500 FIFTH AVENUE, NEW YORK 18
THE WILCO COMPANY, 6800 McKINLEY AVE., LOS ANGELES 1

Ann Haviland, famous for fine perfume, selects Palm Brothers, the most famous name in decals. This choice is in keeping with that of leading executives everywhere — because Palm Brothers Decals means distinctive product identity.

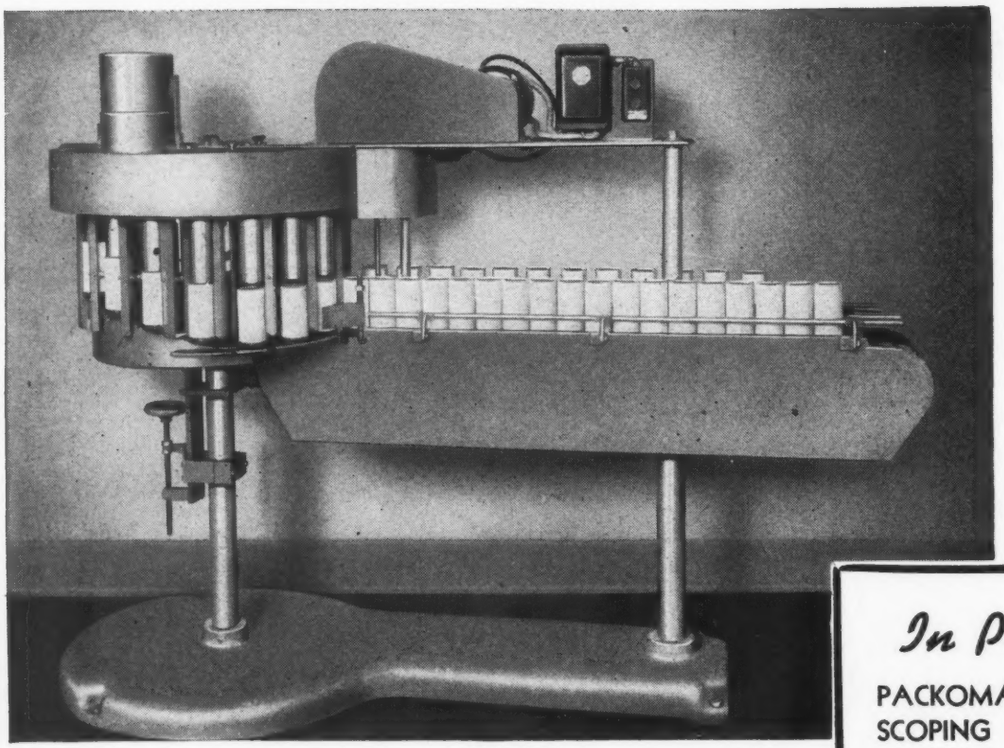
You, too, can add immeasurably to the irresistible eye appeal and the certainty of your package recognition with Palm Brothers Decals. You'll like their ease of application, their permanency and economy.

There's a Palm Brothers Decal for almost every commercial surface, with proved properties to give you the utmost in satisfactory performance.

See for yourself! Drop us a note and we'll be pleased to prepare individually designed sketches, quote prices, and furnish complete information.

THE PALM BROTHERS Decalcomania Co.

CINCINNATI..12...OHIO..U.S.A.



In Process

PACKOMATIC'S TELESCOPING FILLER for bottom-sealed cartons, rectangular and square cans, jars and canisters. We invite your inquiries—send samples for recommendation.

AVOID WASTE—ANNOYING DUST...WITH PACKOMATIC'S NEW TELESCOPING FILLER...

It is just as simple in construction and operation as it looks to be—just as *effective* a package filler as it is simple—PACKOMATIC'S telescoping volumetric filler.

Packers of free and non-free flowing products—such as cleansers, bowl cleaners, flake lye, drain pipe openers, chemical cleaners, soot removers, coffee concentrate, baking powder, cereals, soap powder, etc.—will want the facts and data on this new member of the PACKOMATIC family—will want to know where it will help them do a better job more quickly and at lower costs.

Designed for filling cylindrical containers, paper and metal cans—PACKOMATIC'S telescoping volumetric filler helps avoid waste and annoying dust . . . because packages are *raised* onto the filling tubes (--) then lowered in one smooth, continuous and effective operation.

PACKOMATIC'S telescoping volumetric filler fills 60 up to 100 packages per minute . . . can be *built* on *special order* for *higher* speeds. Unit requires minimum of floor space . . . minimum of attention. Precision design and sturdy construction insure you day-in, day-out, trouble-free operation.

Submit your carton-filling and case-sealing specifications to PACKOMATIC for postwar check and suggestion. Contact the PACKOMATIC office nearest you, as listed in Metropolitan Classified Directories. Or send details and product samples to Joliet . . . No charge for counsel . . . no obligation.

TYPICAL PACKOMATIC EQUIPMENT

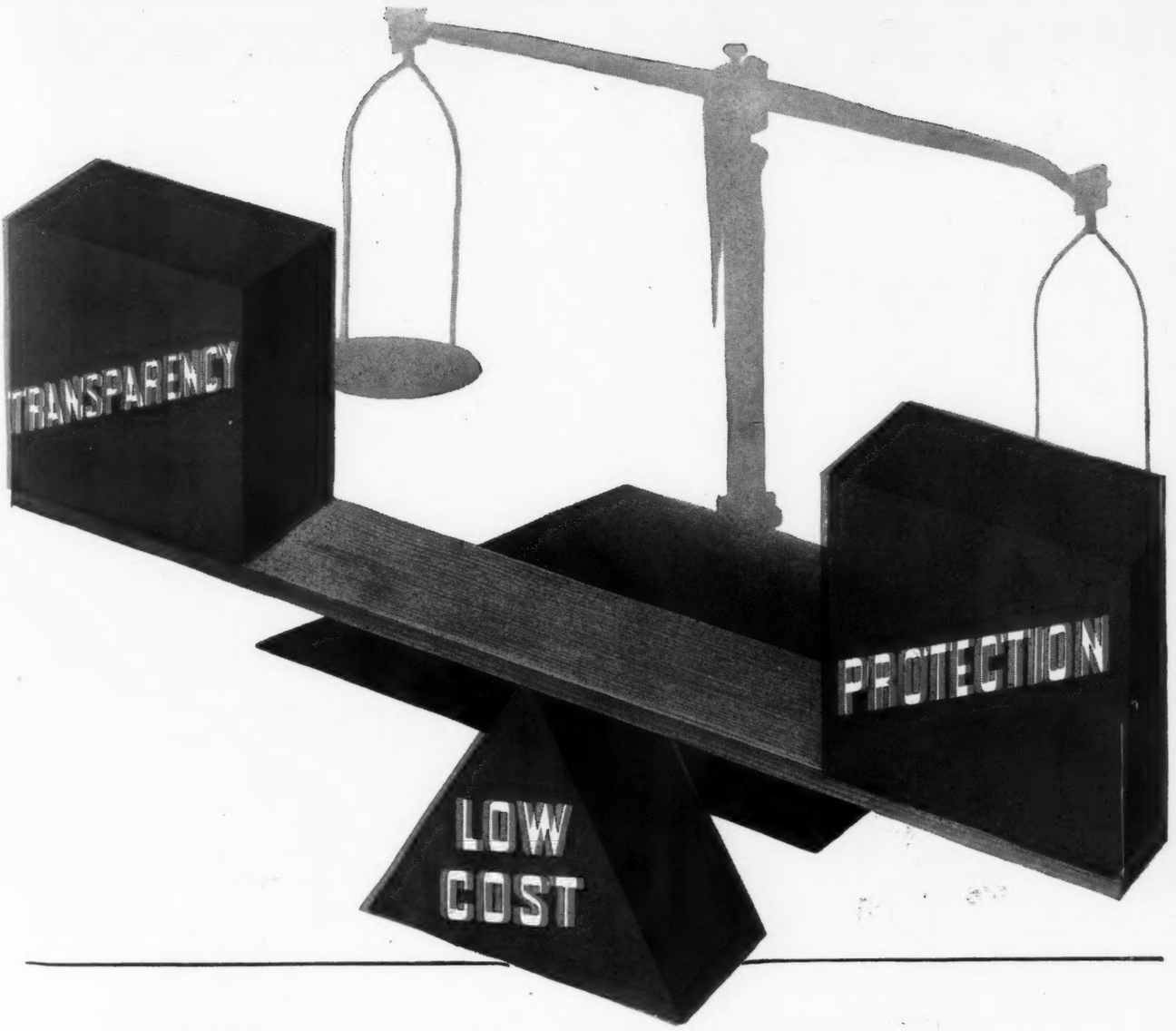
Case Sealers • Case Imprinters • Carton Sealers
Volumetric Fillers • Net Weight Scales
Carton Making Machines • Dating (Coding Devices)
Paper Can Tube Cutters • Paper Can Tube Gluers
Paper Can Shrinkers • Paper Can Cappers

PACKOMATIC

PACKAGING MACHINERY

J.L. FERGUSON CO. JOLIET, ILL.

New York • Chicago • Boston • Cleveland • Denver • Los Angeles • San Francisco • Seattle • Baltimore • Philadelphia



Weigh your package carefully

before you put your future in it!

▸ Of course you will want your package to be eye-catching to tie up with modern merchandising trends. You'll find the sparkling *transparency* of Du Pont Cellophane makes your product its own best salesman.

▸ Then you'll want protection to assure value-conscious shoppers full quality. The 56 types of Du Pont transparent films (Cellophane, cellulose acetate and polyvinyl films) offer you protection chemically tailored to safeguard the freshness and flavor of a wide variety of products.

▸ What about economy? Du Pont Cellophane gives transparent protection at *lowest cost*. It provides balanced advantages for effective packaging!

The demand for Du Pont Cellophane still exceeds the supply, but we hope the day is now not far off when our converters and ourselves can meet all requirements. E. I. du Pont de Nemours & Co. (Inc.), Cellophane Division, Wilmington 98, Delaware.

DU PONT
REG. U. S. PAT. OFF.

Cellophane

Shows what it Protects—at Low Cost

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

Cello-wrapping UP TO 250 per minute *for Protection*

CANDY
TOYS
DRIED FRUIT
CIGARETTES CIGARS
RAZOR BLADES
PHARMACEUTICALS
BAKED GOODS
FROZEN FOOD PACKS
DEHYDRATED PRODUCTS
FIRST AIDS
BABY GOODS

Wrap them on **Scandia*** *high-speed* **PRECISION** *machines*

For tight-wrap or loose-wrap products, Scandia units have earned a reputation in speed economy, and *positive* adhesion of the wrap, so as to

KEEP MOISTURE *out* or KEEP MOISTURE *in*

Standard Scandias are available for most standard types of packages. Certain attachments are indispensable for economy on machines supplied

WITH or WITHOUT TEAR-TAPE ATTACHMENT

The inclusion of revenue stamps or Union stamps or the handy tear-tape are features of Scandia units, as extra attachments where they are wanted.

* Manufactured under BRONANDER Patents.

Scandia MANUFACTURING CO.

NORTH ARLINGTON NEW JERSEY

Nylons ARE BACK ! . . . and in Mason Boxes

Lucky girl! She has just received a brand new pair of exquisite nylons through the mail . . . and they probably came in a Mason box.

Many retail stores and some hosiery manufacturers team together to make the most equitable arrangement for early distribution on nylon hose. It was a coupon order system which permitted store customers to get early delivery on precious nylons, and thanks to a standard Mason box which permitted ease of packing, labeling and shipping, the nylons went out all over the country. Thousands of economical uses for these handy MailMasters make them an economical must in your mailing, shipping and distribution departments. Write today for new catalog, to Dept. 22, The Mason Box Company, Attleboro Falls, Mass.

The MASON BOX COMPANY

MANUFACTURERS OF AMERICA'S NUMBER ONE BOX . . . THE MASON MAILMASTER

flexibility...

GLU-WELD
water-resistant adhesives

TUBE WINDING
adhesives, both paper and cellulose film

FLEXIBLE GLUES
for better non-warp qualities

LABELLING ADHESIVES
labels to tin, glass, foil, films, and paper

WINDOW ADHESIVES
for all cellulose films in window carton work

SPECIALTY ADHESIVES
You name the problem
We have the adhesive

LABELLING ADHESIVES by

UPACO

...rigidity

UPACO . . . a name recognized as a symbol of quality in all phases of adhesive manufacture. **UPACO** products **rigidly** conform to specifications for their particular uses and the line is completely **flexible** to meet any adhesive problem. You cannot do better anywhere.

UNION PASTE COMPANY
Hyde Park, Massachusetts

WHAT WE KNOW ABOUT MRS. JONES

She reads magazine ads

Talks about products with friends

Reads ads in newspapers

Sees outdoor advertising

Listens to radio commercials

...then she shops and decides WHAT to buy...

when she's in the store!

National surveys have confirmed—what every leading *retail* merchandiser has long known—that women, who buy ¾ of all goods sold at retail—also make ¾ of their *buying decisions* at the point-of-sale—where they can SEE what they want.

Hence—if your product is packaged—the *appearance* of your package is a VITAL selling factor.

Never Underestimate the Power of the Package

The package that attracts the eye, arouses interest and makes a better impression of quality than competing packages—*wins sales.*

LET RITCHIE WORK WITH YOU to develop a better package at low unit cost. One that will instantly identify, fully protect and conveniently dispense your product—practical—production-planned—easy to fill or pack—to handle, to stack and display—but *above all* designed for eye-appeal, for quality impression—a *package that sells!*

COPYRIGHT 1946, W. C. RITCHIE & CO.

Never the Power

W.C. Ritchie and COMPANY

8844 Baltimore Avenue • Chicago 17

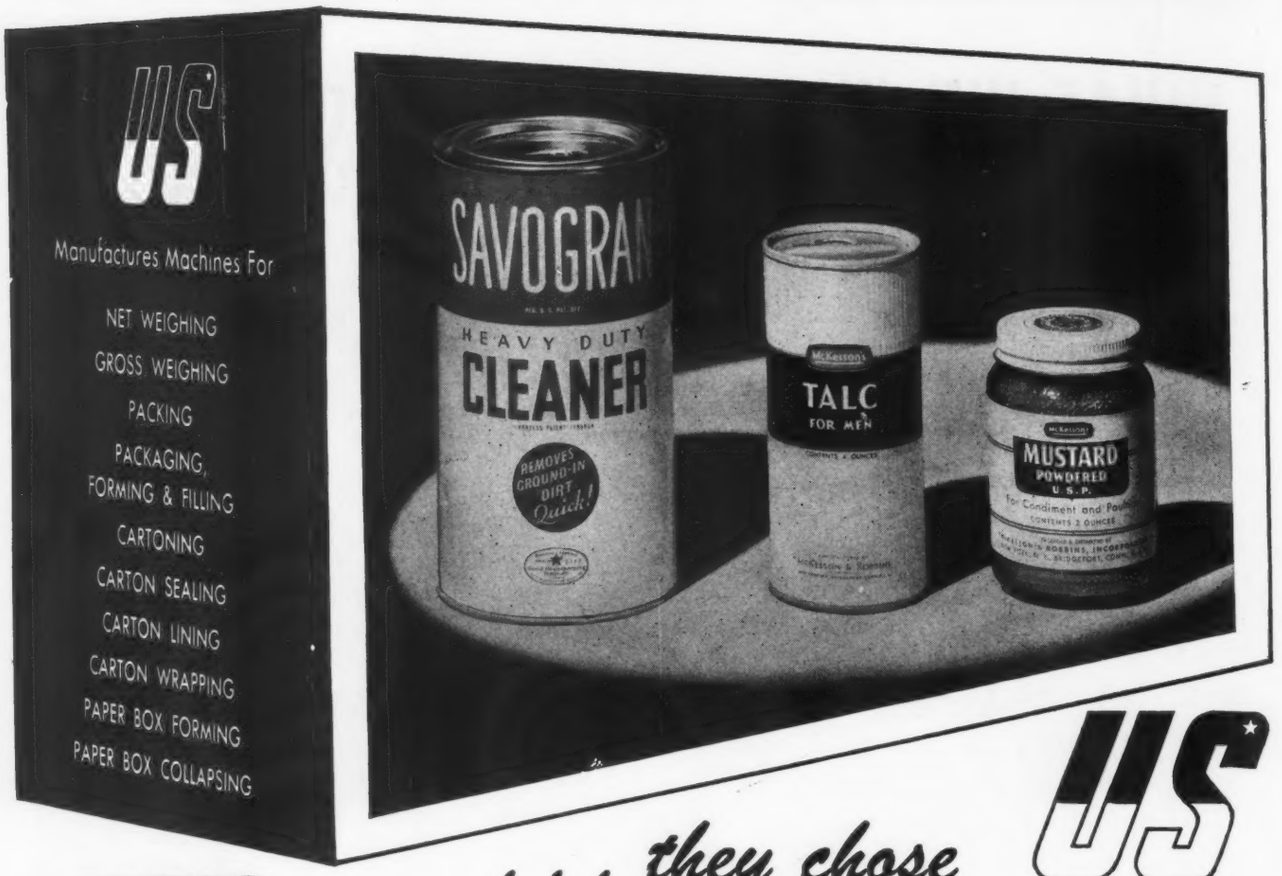
★ SET-UP PAPER BOXES

★ FIBRE CANS

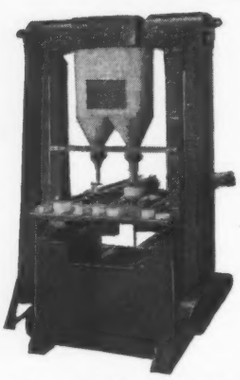
★ TRANSPARENT PACKAGES

Underestimate of the Package!

NEW YORK • DETROIT • LOS ANGELES • ST. LOUIS • MINNEAPOLIS • MILWAUKEE • ATLANTA • NEW ORLEANS • DENVER • PORTLAND • SEATTLE • MIAMI



. . . they chose US



Model MH "BOND" Semi-Automatic VOLUME FILLER, WEIGHER OR PACKER

The manufacturers and packers of the products illustrated above came to ***US*** for dependable packaging equipment. The Model MH "Bond" filling machine was selected for several reasons. (1) The MH "Bond" is semi-automatic and therefore can be converted easily from one package size to another or (2) it can be used for filling bags, envelopes, cartons, jars or cans. (3) A single operator can fill up to 40 containers per minute. (4) Packed weight is controlled to a fraction of an ounce. (5) It is ideal for packing such products as ground spices, face powder, talcum, flour, soap powder, cocoa, etc.

The Model MH "Bond" is a twin-station machine. ***US*** also manufactures several other models of semi-automatic and automatic machines with one, two or four stations.

Regardless of your packaging machinery problems, it will pay to discuss them with ***US***, just as others have done for many years.

US Automatic Box Machinery Co. Inc.

Owning and Operating

NATIONAL PACKAGING MACHINERY CO. • CARTONING MACHINERY CORP.

18 ARBORETUM ROAD, ROSLINDALE, BOSTON 31, MASS.

Branch Offices: NEW YORK CLEVELAND CHICAGO
LOS ANGELES (KRUOH EQUIPMENT & SUPPLY CO.)

Presenting

SYNTILITE

An Achievement in Plastic Films

After years of research and experiment, a plastic film has been created with a cloth-like texture possessing the warmth of touch, softness and beauty hitherto associated only with woven fabrics.

Its name is SYNTILITE. Its uses are legion. Its arrival opens a challenging vista of sales opportunity.

SYNTILITE imparts new and captivating beauty to a vast range of colors. Transparent, easily worked, it has excellent draping qualities. It's a film of fashion.

You'll soon see it making merchandising news as a material for draperies, shower curtains, raincoats, upholstering—and an infinite variety of other uses to which it is equally adaptable. Write for samples and details to

pfc
PLASTIC FILM CORPORATION

PLASTIC FILM CORPORATION

PLANT: PLAINFIELD, CONN. N. Y. OFFICE: 475 FIFTH AVENUE

It's SYLVANIA* for Cellophane!

to protect tobacco

...and beans

WHEN YOU think of protection, think of Sylvania Cellophane. For this versatile packaging material is more than an attractive wrap. Its important functional qualities make it indispensable protection for perishable products such as every type of tobacco, confectionery, baked goods or frozen foods. Sylvania Cellophane is air-, dust- and moisture-proof... assures retention of flavor, freshness and aroma.

AND DON'T FORGET, Sylvania is an improved cellophane. Today it offers even better protection than ever before to an extensive list of packaged products.

...and marshmallow creams!

SYLVANIA CELLOPHANE

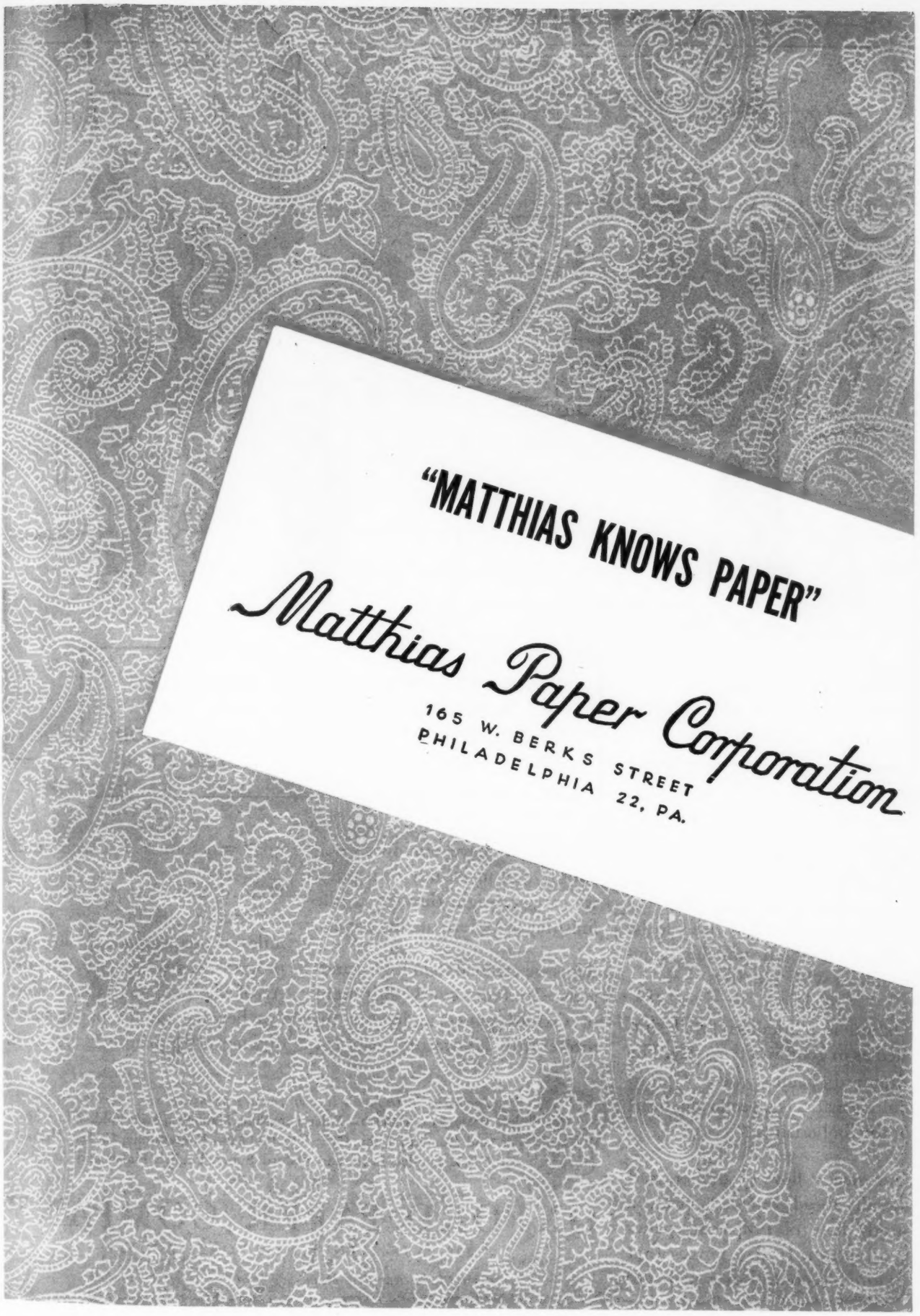
Made only by SYLVANIA INDUSTRIAL Corporation

Manufacturers of cellophane and other cellulose products since 1929

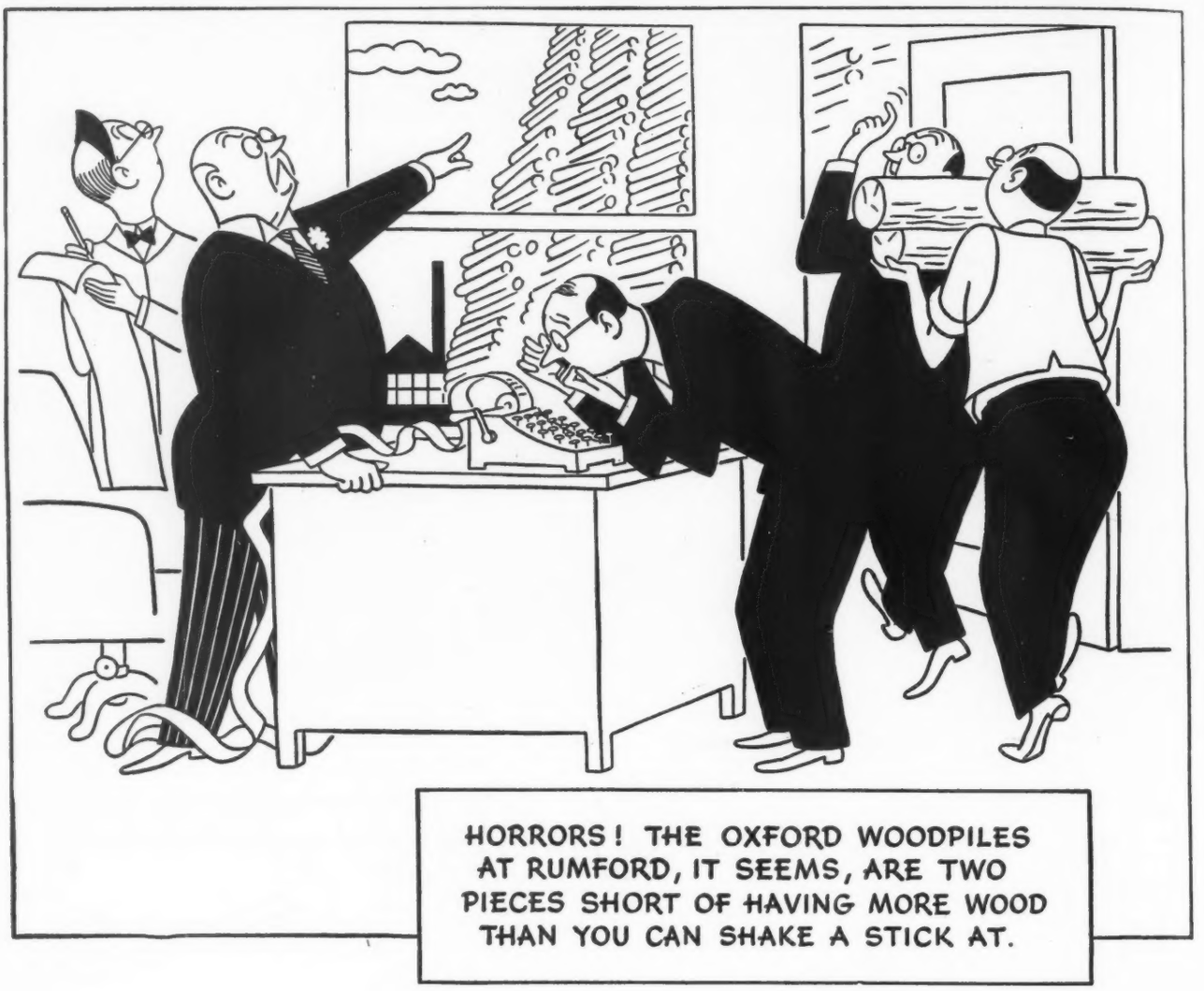
General Sales Office: 122 E. 42nd St., New York 17, N.Y. ★ *Plant and Principal Office:* Fredericksburg, Va.

SYLVANIA CELLOPHANE

•Reg. Trade Mark


"MATTHIAS KNOWS PAPER"
Matthias Paper Corporation
165 W. BERKS STREET
PHILADELPHIA 22, PA.

Near Crisis at Oxford Paper Company by Tony Barlow



WOOD is the basic ingredient in the making of quality book papers. Where wood is sufficiently plentiful there is less need to be concerned about possible compromises with quality.

Oxford is particularly well situated as to good wood supply. The Rumford plant, where Oxford pulp is made, is close to the heart of the timberlands.

Our steady flow of timber, and months-ahead reserves, mean a steady flow of pulp and paper production. It also means that Oxford has control over its paper quality from start to finish. For we not only have our own wood supply and make our own pulp, we carry on right through to the finishing of Oxford quality papers.

Thus we can maintain high standards. In fact, every shipment of Oxford paper undergoes innumerable laboratory tests for quality before it leaves the mill.

Oxford also has many years' experience making over 1,000 miles of quality paper a day. Our progressive research never stops. All of which explains why Oxford has become quality-paper headquarters in the printing paper field.

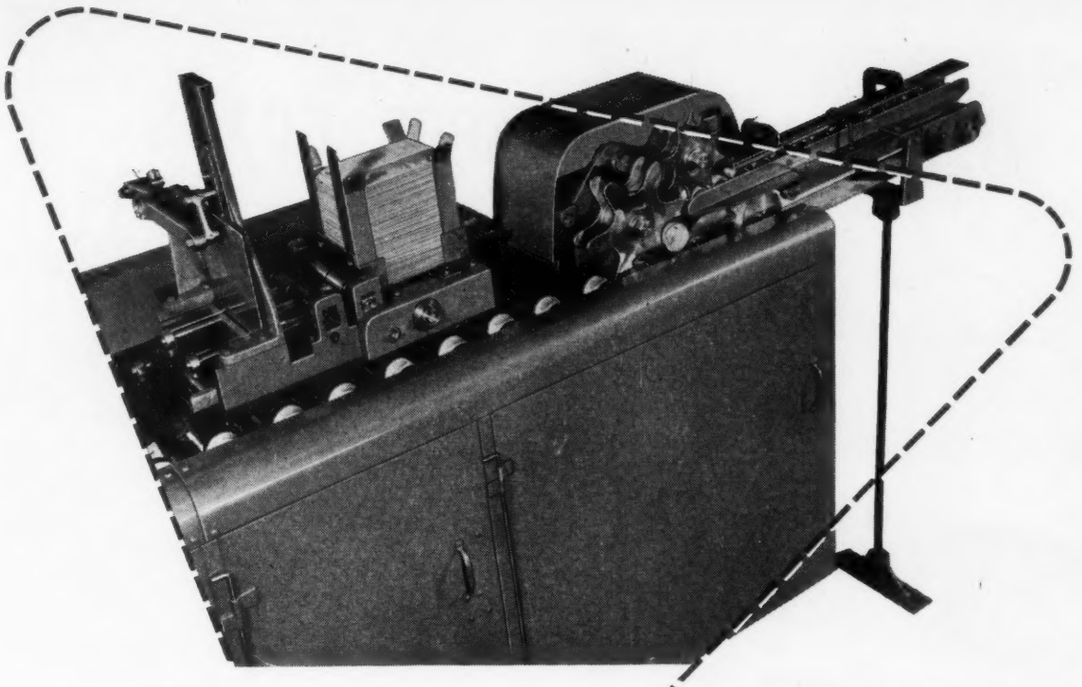
Included in Oxford's line of quality printing and label papers are: ENAMEL-COATED—Polar Superfine, Maineflex, Mainefold, White Seal and Rumford Litho C1S; UNCOATED—Engravatone, Carfax, Aquaset Offset, Duplex Label and Oxford Super, English Finish and Antique.

OXFORD PAPER COMPANY

230 PARK AVENUE, NEW YORK 17, N.Y.

MILLS at Rumford, Maine and West Carrollton, Ohio

WESTERN SALES OFFICE: 35 East Wacker Drive, Chicago 1, Ill.



A New Automatic, Truly Constant Motion Transfer . . . for Articles Reaching Cartoner in Horizontal Position

(Inset) Both 2 oz. and 4 oz. jars of Ice-Mint are cartoned on this Jones convertible cartoner, the change from one size to the other requiring only 30 minutes. Ice-Mint is made by the Foster-Milburn Company, Buffalo, N. Y.

(Above) This new Jones Cartoner receives jars lying horizontally on belt conveyor from discharge of labeling machine, gradually transfers jar from belt to buckets of conveyor, feeds and folds leaflet, opens carton, stencils lot number on flap, gradually inserts jar together with leaflet, closes and glues carton.

First to develop constant motion cartoning, R. A. Jones & Company, Inc., now introduces a new, automatic, and truly constant motion transfer for articles that come to the cartoner in a horizontal position.

Using a vertical starwheel construction (patent applied for), this machine transfers the articles from the in-feed belt conveyor to the bucket conveyor. With no starting and stopping, no dependence on gravity, the load is gradually and positively lowered into the bucket. The new cartoner operates at higher speeds, more silently and with gentler handling of the load.

This new Jones "first"—already incorporated in a cartoner for the Foster-Milburn Company, Buffalo, N. Y.—illustrates the Jones policy of constant improvement and of making improvements available to its customers at the earliest possible moment. For full information, write (enclosing sample of your product) to R. A. Jones & Company, Inc., today.

R. A. JONES & COMPANY, INC.

P. O. Box 485 CINCINNATI, OHIO

REMEMBER THE MAJORITY OF AMERICA'S CARTONED PRODUCTS ARE JONES CARTONED

MILLER SET-UP PAPER BOXES

Designed to count at the

Point of Use

Their attractiveness encourages purchases

Point of Sale

They deliver the product ready for use . . . with quality and efficiency unimpaired.

and designed for specific economies

In Filling

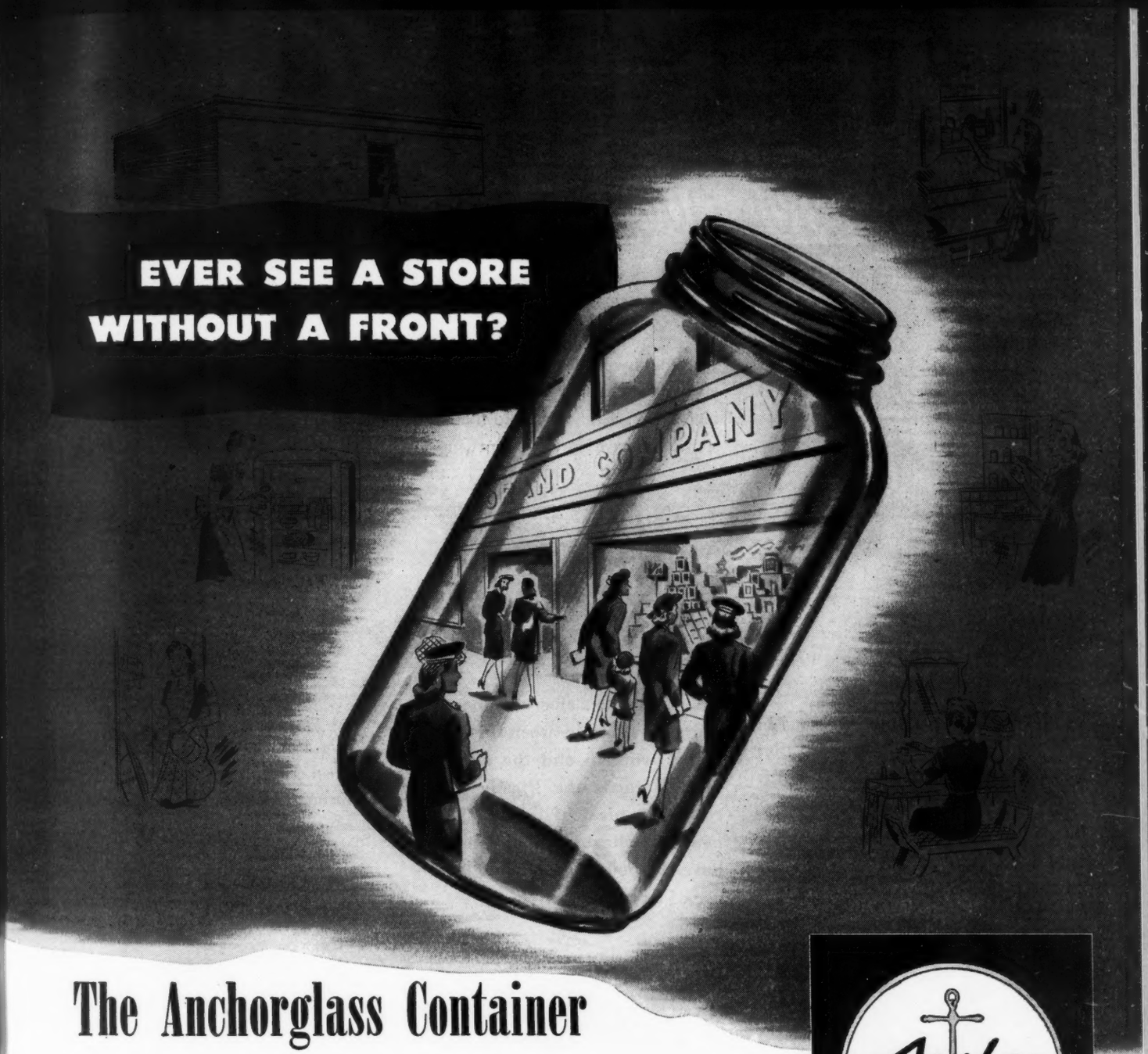
They save time . . . speed the whole operation

In Storage and In Shipping

They stack economically . . . protect contents

WALTER P. MILLER COMPANY, inc. *Paper Boxes*

452 YORK AVENUE • PHILADELPHIA 23 • PENNSYLVANIA



The Anchorglass Container

IS A MINIATURE SHOW WINDOW

THRIFTY housewives have learned to "window shop" not only store fronts, window displays and show cases, but packaged goods of all kinds. It is natural and easy for them to see and evaluate at a glance. That's why stores have show windows. That's why food packers are turning to sparkling crystal glass containers. Each Anchorglass Container is a miniature show window which displays your products with all their colorful eye and appetite appeal.

Too, the Anchorglass Container imparts no foreign tastes or flavors. It delivers your choice foods to the consumer without losing any of the original goodness packaged at your plant. It is easy and safe to open and can be tightly and easily resealed to protect unsued portions. It's a convenient, sanitary, protective and attractive package.

Make it possible for the housewife to see your product and your sales volume will be increased.

Anchor
CONTAINERS and CAPS

Look in ANCHOR HOCKING'S HOBBY LOBBY
CBS NETWORK . . . THURS. EVE.

PRODUCTS OF
ANCHOR HOCKING GLASS CORPORATION
LANCASTER, OHIO

You'd never guess what's in this tube!

Sorry, you're not even warm.

***Wood* is in the tube. Nice, juicy plastic wood. And therein lies an interesting story.**

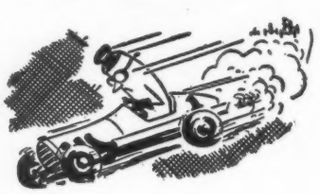
Plastic wood didn't always come in tubes. It used to come in cans only. But the average householder, who uses the product only occasionally, found this discouraging. For contents of the can would often dry out between uses.

This was Sun Tube's cue. "How about a small, air-tight container?" we asked. "One that can easily be opened and closed, exposing only a minute portion of the contents to evaporation." Whereupon the Plastic Wood people replied, "Let's see what you can do."

So we showed them. Today, as a result of packaging wood in a convenient, compact tube, sales to the occasional user have increased enormously!

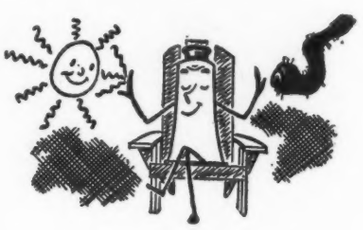
Cue for you

There may be a closer connection than you think between this packaging problem and the one *you* face. Because the Plastic Wood story is typical of the many unusual packaging problems we have helped solve through the use of Sun Tubes.



And a good example, too, of the head-start that perfect packaging will give your product in the race for markets that's only just beginning.

You probably know the advantages of the collapsible tube. The fact that it's convenient and compact, that it's germ-proof and light-proof.



What you may *not* know is that new developments have made Sun Tube the ideal container for many products not formerly considered even prospects for a tube.

***Your* product may be one of them. At any rate, the Sun Tube representative nearest you will be glad to furnish you with information and advice. Why not phone or write him or Sun Tube's main office, 181 Long Ave., Hillside, N. J.**

Sun Tube Corporation

HILLSIDE · NEW JERSEY

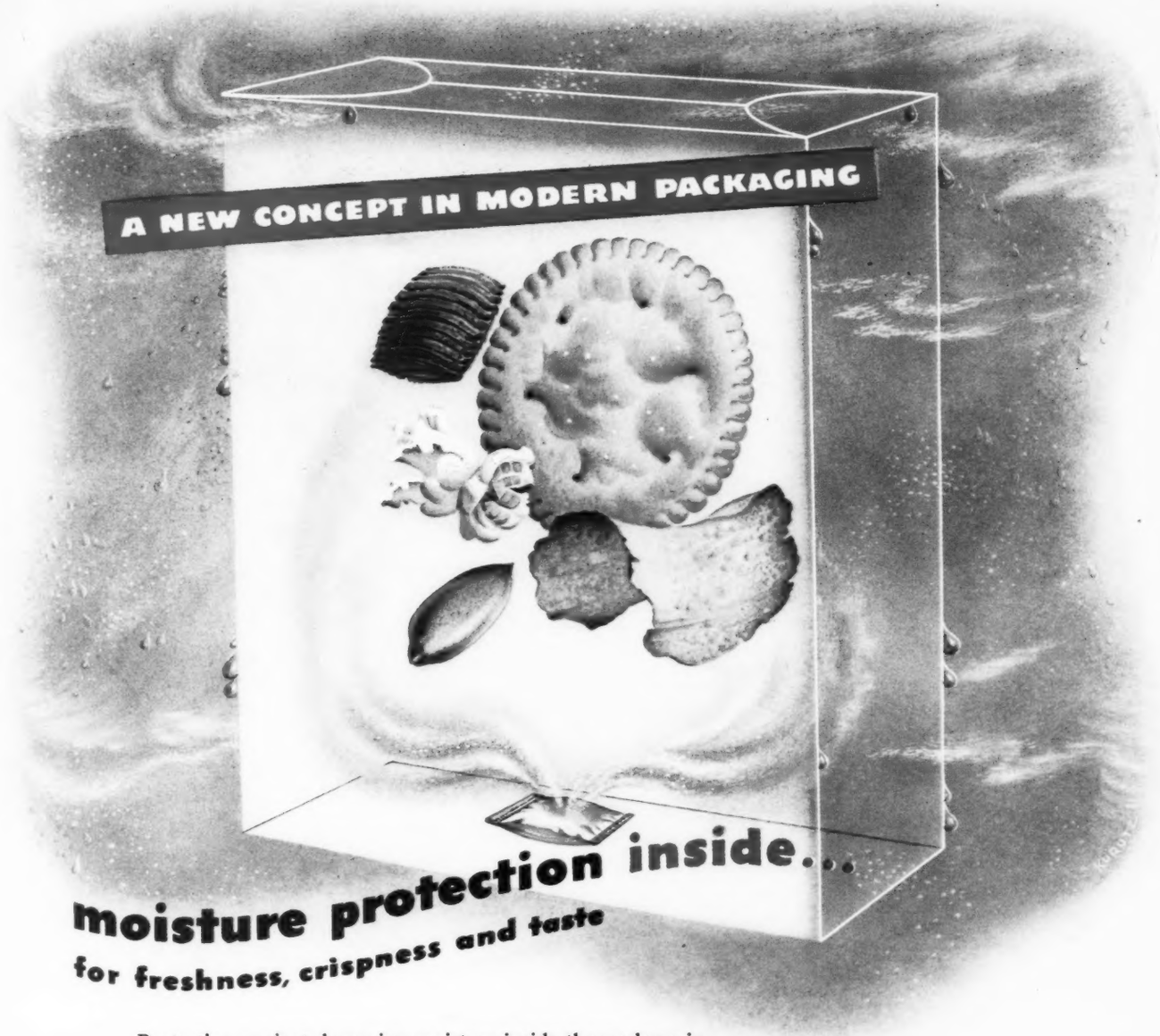
CHICAGO 1, ILL.
James L. Coffield, Jr.
360 No. Michigan Avenue

ST. LOUIS 1, MO.
M. P. Yates
Arcade Building

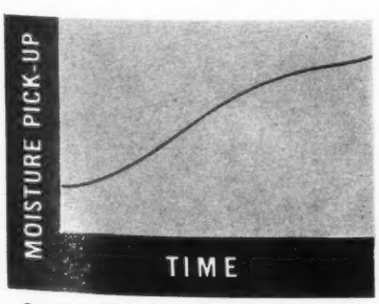
ST. PAUL 1, MINN.
Alexander Seymour
615 Pioneer Building

LOS ANGELES 27, CALIF.
R. G. F. Byington
1260 North Western Ave.

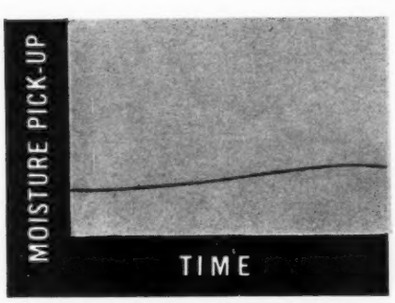
CINCINNATI 8, OHIO
Ralph H. Auch
3449 Custer Road



Protection against damaging moisture inside the package is now economically practical with Desiccite,* the highly efficient, low-cost drying agent produced by one of the world's largest manufacturers of desiccants. Any commodity from foods to metal products can be moisture-protected at such low cost that manufacturers with packaging problems are turning to Desiccite for "inside packaging protection." Filtrol* engineers will gladly consult with you on your packaging problems. Write today for full information.



ORDINARY PACKAGING



DESICCITE PACKAGING

Dry Pack with DESICCITE

a Filtrol Product

FILTROL CORPORATION

General Offices: 634 S. Spring Street, Los Angeles 14, Calif.
Plants: Vernon, California, and Jackson, Mississippi

★ *Filtrol and Desiccite Reg. U. S. Pat. Off.*

DESIGNERS . . . ARTISTS . . .

DO YOU KNOW THAT . .

Trans-adhesives

- ★ Give you transparent and adhesive type proofs that can be applied to package designs, regardless of color scheme . . .
- ★ Give you type proofs in black, white or any desired color . . .
- ★ Make type indications on "dummies" look like actual printed job . . .
- ★ Give you typography in any type face specified! . . .
- ★ Provide a laminated protective coating over the layout that guards against rough handling . . .
- ★ Make it possible to mount your own type in position over water color sketches, oil paintings, wash drawings, photographs, etc. . . .
- ★ Save camera time, eliminate extra negatives and delicate strip-ins on plates . . .
- ★ *Write for more facts, or send a trial* order*

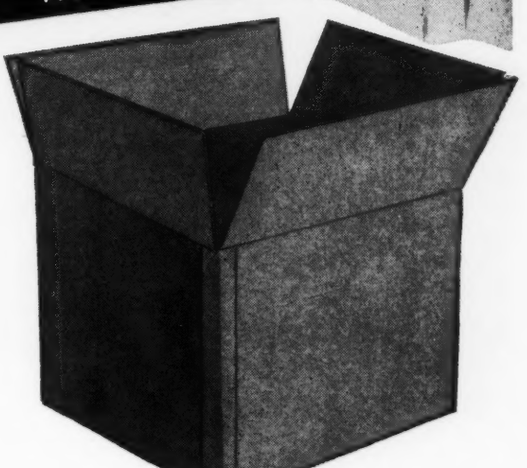
Monsen-Chicago

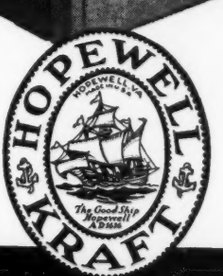
TYPOGRAPHERS • 22 EAST ILLINOIS STREET, CHICAGO 11, ILLINOIS

*When ordering Trans-adhesives send us same instructions ordinarily furnished on any typographic job.

IT'S THE OUTER COVER THAT COUNTS!

The "package" that Nature has provided for the oyster has been evolved through eons of time until it is perfect for the purpose. You can't wait that long for the perfect container. You don't have to. Because we are Board specialists Hummel-Ross probably has a product which will fill your requirements exactly. Or, if necessary, we can originate and create the Kraft product you need.





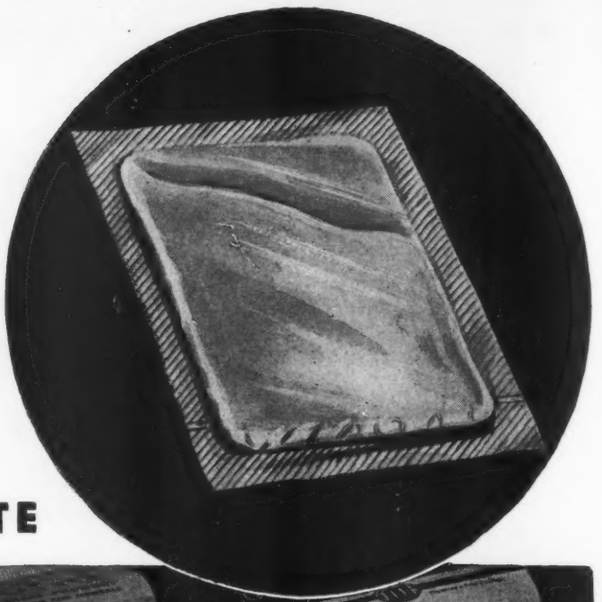
Originators • Creators

HUMMEL-ROSS FIBRE CORPORATION

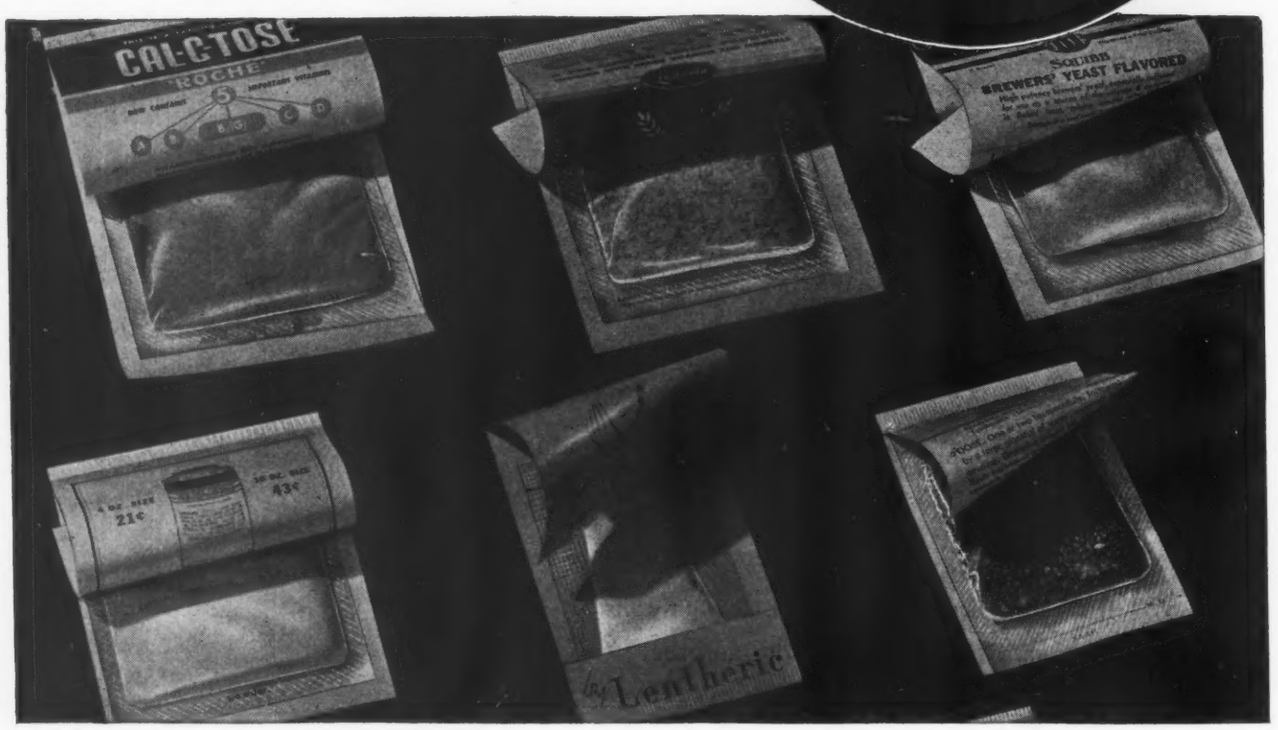
Hopewell, Virginia, U. S. A.

FOR THE NEW

Powder Package



*SANITAPE-SEALTITE



A Few Representative Adaptations

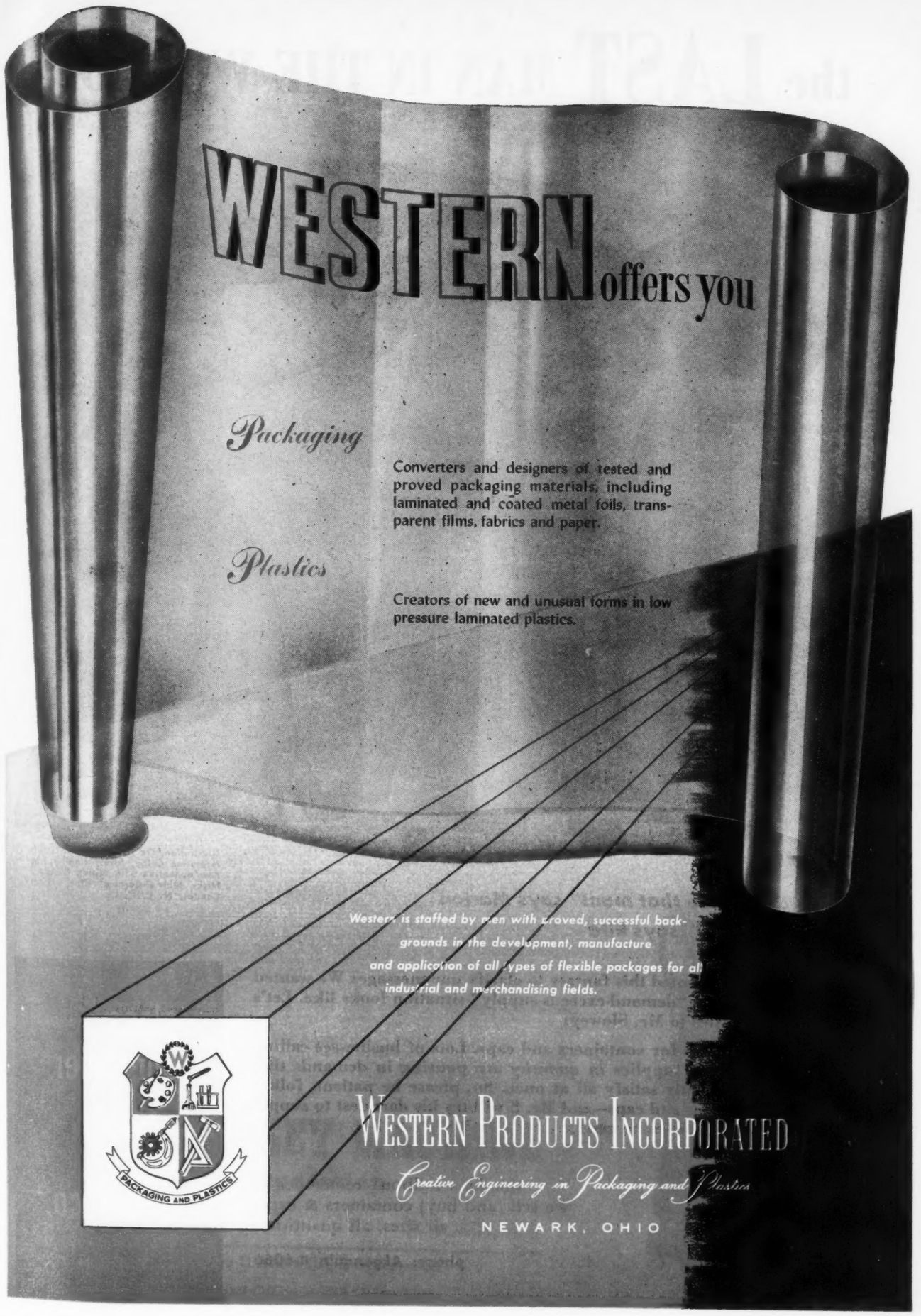
For Powder, Cream or Liquid—for mailing sample, professional detailing, counter merchandising or standard-sale package—Sanitape-Sealtite offers unequalled advantages—unique protection, appealing visibility, maintained strength, convenient use, and the very important saving of reduction in the required product-quantity per package. Variety of adaptation of the Sanitape-Sealtite method is endless—each can add a fresh note to sales and merchandising campaigns. If your product is a Powder, Cream or Liquid—pharmaceutical, cosmetic or food—unit-packaging merits careful consideration. Tell us the details of your problem—we will give you a thorough and complete report on our findings.

* Sanitape-Sealtite is a unique method for packaging pills, tablets, capsules, creams and powders, by which each unit or unit-dose is sealed in its own air-tight compartment—assuring complete protection.

UNIT PACKAGING

Sanitape-Sealtite

IVERS-LEE COMPANY
215 CENTRAL AVE., NEWARK 4, N. J.


WESTERN offers you
Packaging
Converters and designers of tested and proved packaging materials, including laminated and coated metal foils, transparent films, fabrics and paper.
Plastics
Creators of new and unusual forms in low pressure laminated plastics.
Western is staffed by men with proved, successful backgrounds in the development, manufacture and application of all types of flexible packages for all industrial and merchandising fields.
PACKAGING AND PLASTICS
WESTERN PRODUCTS INCORPORATED
Creative Engineering in Packaging and Plastics
NEWARK, OHIO

the LAST MAN IN THE WORLD!

Illustration: On John C. Slowey's left is Marion Colby, lovely singing star now appearing with Milton Berle at Nicky Blair's Carnival Club, Hotel Capitol, N. Y. C.

"I've got to have that man!" says Marion

"I saw him first!" says Rita

WELL, we've invented this fantasy to clarify our message: We wanted to show what a "demand-exceeds-supply" situation looks like. Let's see how this applies to Mr. Slowey:

Orders are piling up for containers and caps. Lots of businesses calling for these important supplies *in quantity* are pouring in demands that Mr. Slowey can hardly satisfy all at once. So, please be patient, folks! You need containers and caps—and Mr. S will try his darndest to supply your requests as soon as he can!

thanks a million! remember—
we sell (and buy) containers & caps,
all sizes, all quantities.

phone: ALgonquin 4-6066

glass
container
&
cap
outlet co.

876 Broadway
New York 3, N. Y.

She EYES it — before she BUYS it!

EYE-APPEAL

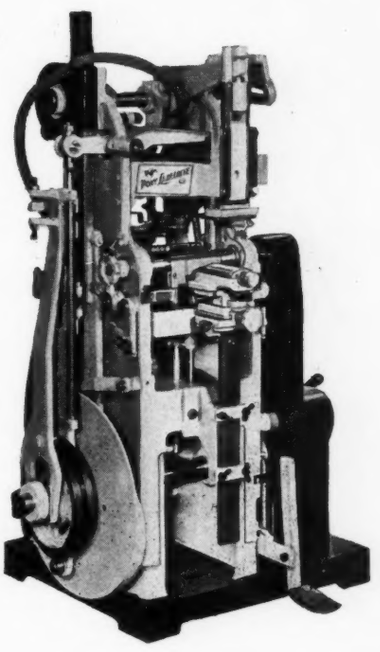
With PRECISION labeling, produced by the **PONY LABELRITE,** the labeling machine that labels *accurately* and cleanly.

PONY LABELRITE*

with its Vacuum Label Handling, together with Twin-Roller Label Gluing assures

- **PERFECT REGISTER**
- **OVER-ALL GLUING**
- **NO GLUE SEEPAGE**
- **CAPACITY OF 60 CONTAINERS PER MINUTE**

*Reg. U. S. Pat. Off.

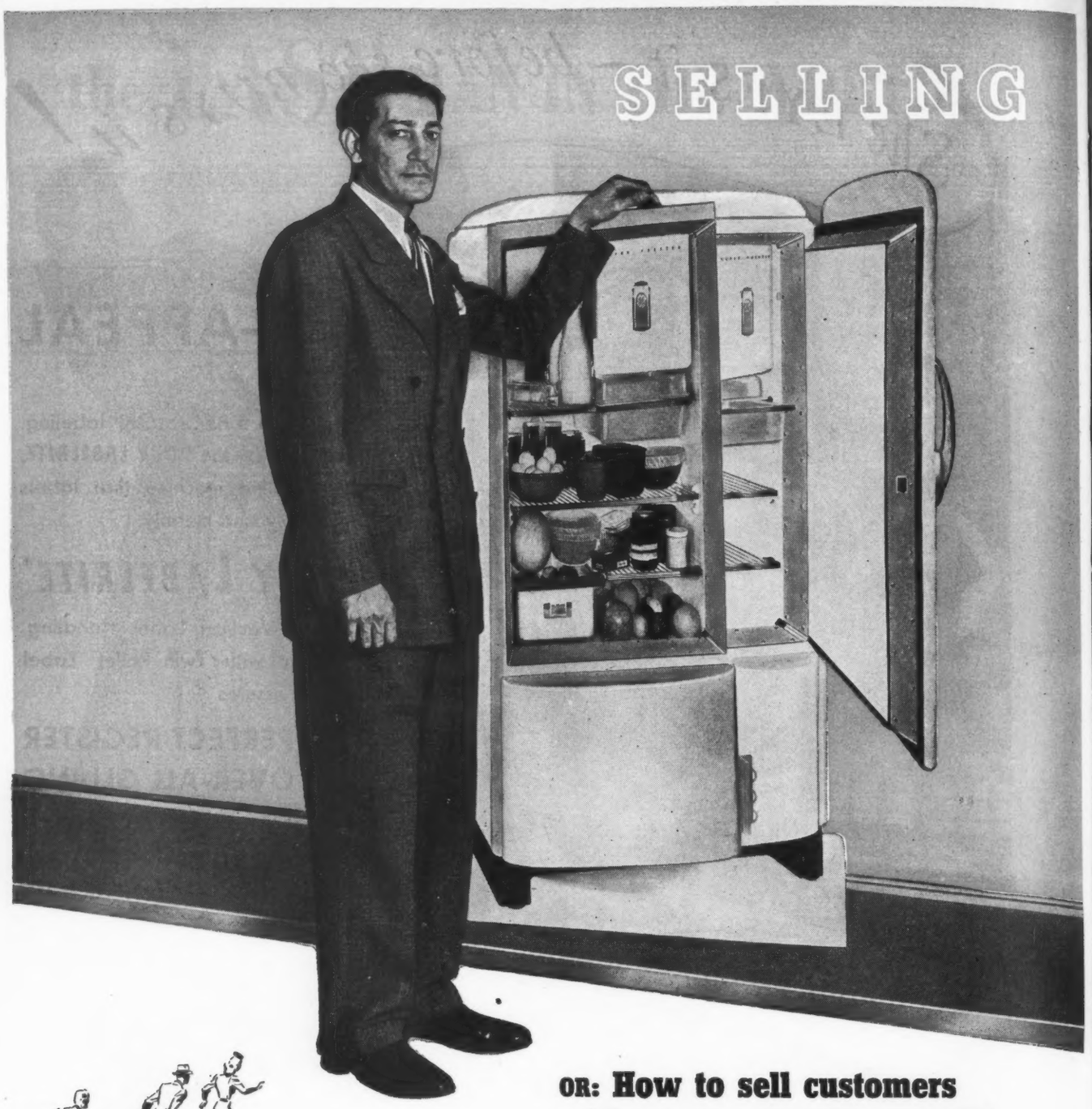


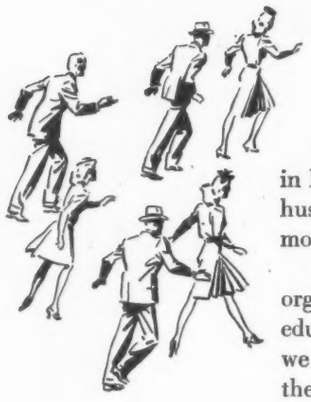
NEW JERSEY MACHINE corporation

1510 Willow Ave. HOBOKEN, N. J.

Chicago Office — 325 West Huron St.

Cincinnati Office — 1701 Carew Tower





OR: How to sell customers without merchandise to sell!

1) There was that big General Electric plant in Bridgeport, Conn. . . . put out of the hush-hush business by the end of the war, but months removed from refrigerator production.

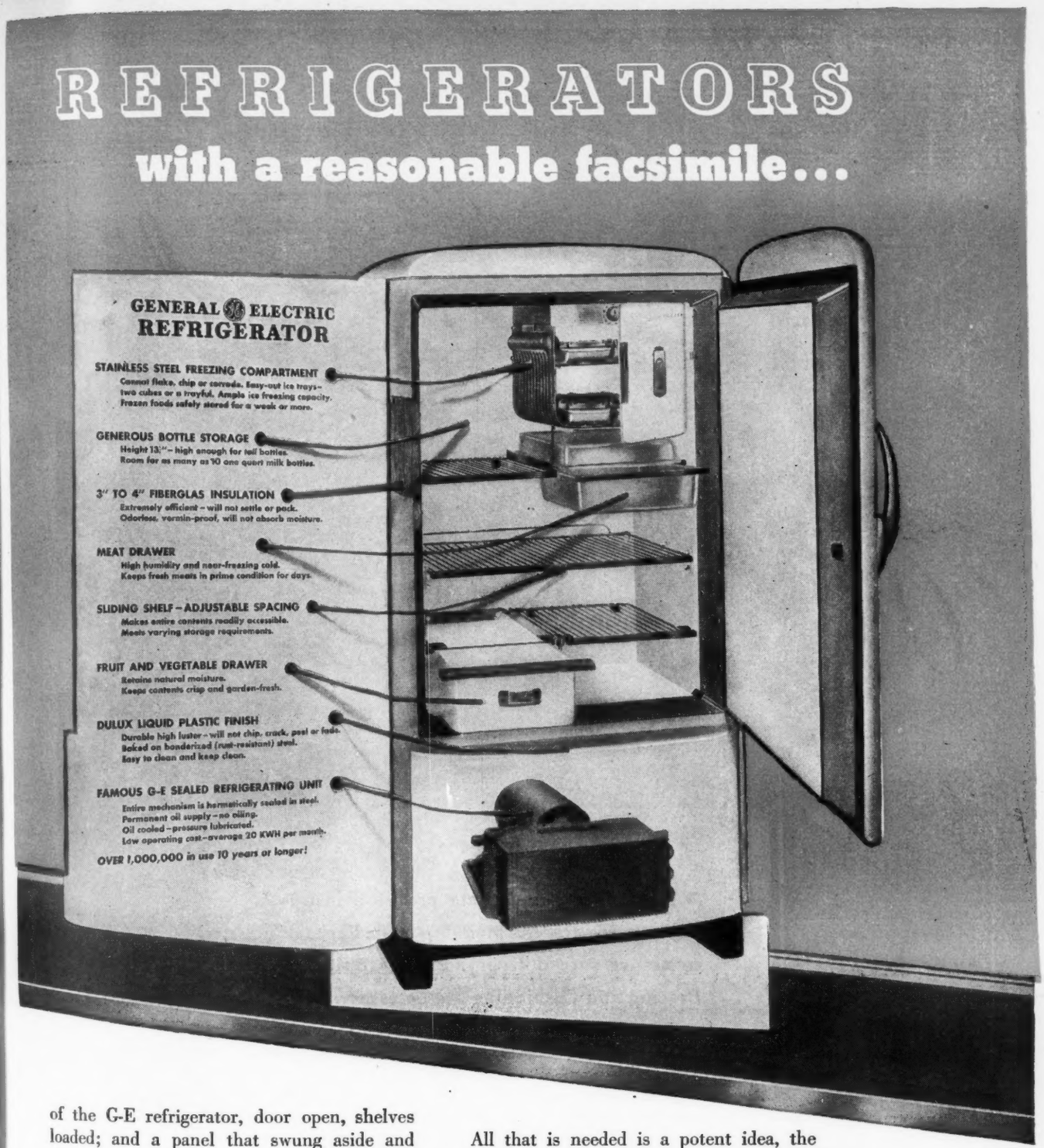
2) There was the G-E refrigerator dealer organization . . . hand picked, experience educated, built with time, sweat (and for all we know, tears, too!); on short rations during the war years, ready for business.

3) There were all the dear customers . . . flush with folding money, the "gimme" light in their eyes, hot to buy refrigerators.

4) There was that uncomfortable time lapse between program and production . . . when prospects might be parted from their money, and dealers decoyed by other lines made.

5) And there (*softly, Professor*) in its big red factory in Long Island City was Einson-Freeman . . . adaptable lithographers who had spent the war years making stuff to show selectees how to shoot, read compasses, flag signals, blinker codes . . . teaching pilots how to handle planes and watch weather . . . printing graphic presentations which meant so much more than whole service manuals.

WELL, to end the suspense . . . our brain trusters broke out with a life-size reproduction


REFRIGERATORS
with a reasonable facsimile...
GENERAL ELECTRIC
REFRIGERATOR
STAINLESS STEEL FREEZING COMPARTMENT
Cannot flake, chip or corrode. Easy-out ice trays—two cubes or a trayful. Ample ice freezing capacity. Frozen foods safely stored for a week or more.
GENEROUS BOTTLE STORAGE
Height 13¾"—high enough for tall bottles. Room for as many as 10 one quart milk bottles.
3" TO 4" FIBERGLAS INSULATION
Extremely efficient—will not settle or pack. Odorless, vermin-proof, will not absorb moisture.
MEAT DRAWER
High humidity and near-freezing cold. Keeps fresh meats in prime condition for days.
SLIDING SHELF—ADJUSTABLE SPACING
Makes entire contents readily accessible. Meets varying storage requirements.
FRUIT AND VEGETABLE DRAWER
Retains natural moisture. Keeps contents crisp and garden-fresh.
DULUX LIQUID PLASTIC FINISH
Durable high luster—will not chip, crack, peel or fade. Baked on bonderized (rust-resistant) steel. Easy to clean and keep clean.
FAMOUS G-E SEALED REFRIGERATING UNIT
Entire mechanism is hermetically sealed in steel. Permanent oil supply—no oiling. Oil cooled—pressure lubricated. Low operating cost—average 20 KWH per month.
OVER 1,000,000 in use 10 years or longer!

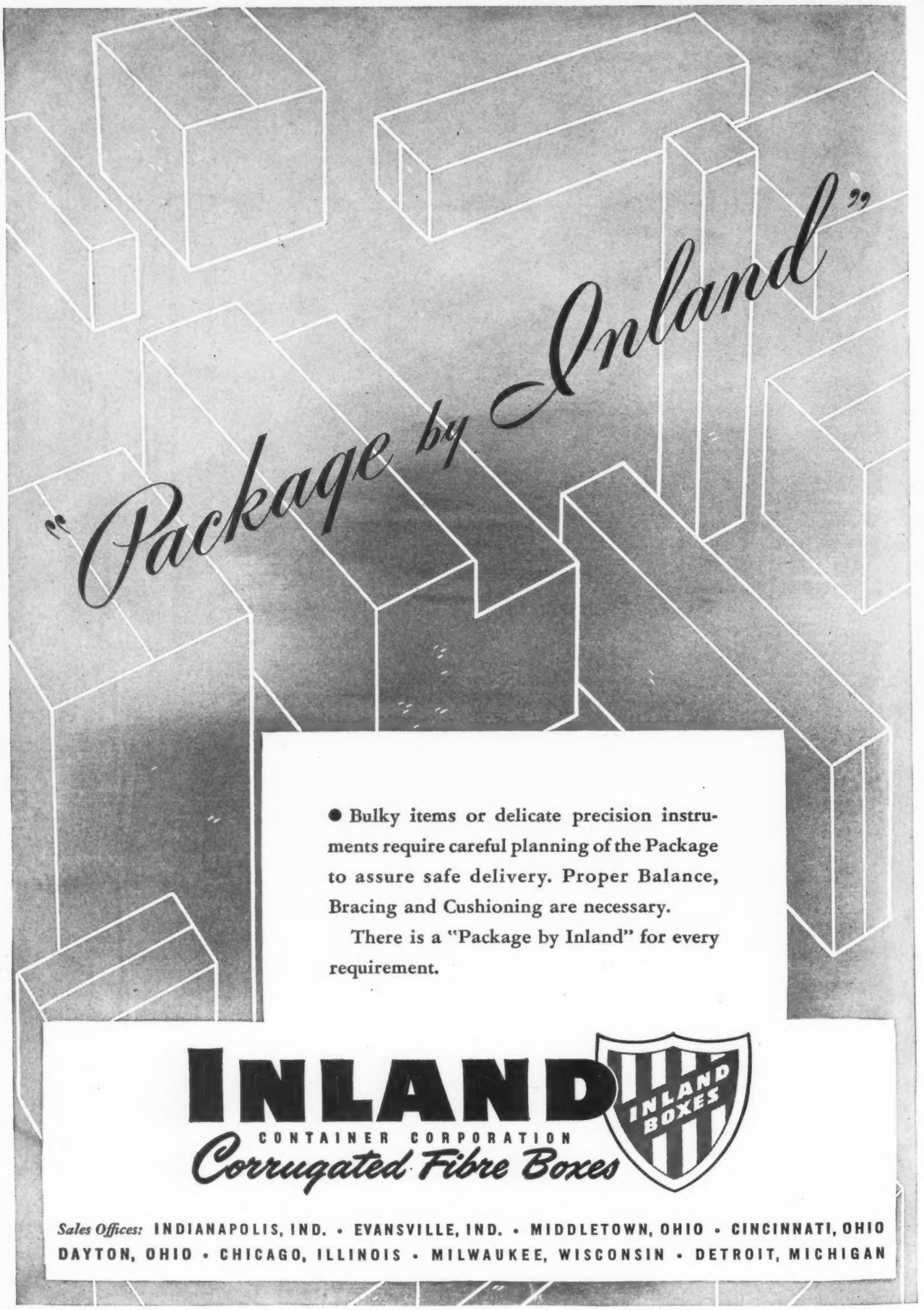
of the G-E refrigerator, door open, shelves loaded; and a panel that swung aside and revealed a full list of G-E advantages, each linked with a ribbon to the part illustrated.

The prospects saw, the salesmen demonstrated with the reasonable facsimile. The panel of sales points assured a complete presentation, helped the salesmen—especially men out of service and a little rusty. Most of the prospects were given enough good reasons for waiting until G-E refrigerators were ready to ship!

Demonstration *by display*, when the product is not available, can make sales . . . hold customers, salesmen, distributor organizations.

All that is needed is a potent idea, the proper pictures . . . and the know-how. And in all modesty, we know of nobody with more know-how, with more experience in its application . . . than the undersigned. Salesworthy suggestions are still available to interested inquirers. Sometimes it pays to phone . . .

EINSON-FREEMAN CO., Inc.
Store Display Lithographers
STARR & BORDEN AVENUES
LONG ISLAND CITY 1, NEW YORK



● Bulky items or delicate precision instruments require careful planning of the Package to assure safe delivery. Proper Balance, Bracing and Cushioning are necessary.

There is a "Package by Inland" for every requirement.

INLAND
CONTAINER CORPORATION
Corrugated Fibre Boxes

INLAND BOXES

Sales Offices: INDIANAPOLIS, IND. • EVANSVILLE, IND. • MIDDLETOWN, OHIO • CINCINNATI, OHIO
DAYTON, OHIO • CHICAGO, ILLINOIS • MILWAUKEE, WISCONSIN • DETROIT, MICHIGAN

Thousands of food products owe their shelf-life freshness and taste values to protective packaging papers by RHINELANDER

COOKIES OWE THEIR TASTE-LIFE TO PROTECTIVE PACKAGING

"Help yourself to the Cookies" is an invitation accepted by all America. Naturally, because in these toothsome nutrients Mrs. Housewife is provided a food-gap filler that has made the cooky and cracker industry one of the Country's largest. With typical American ingenuity, these dainties are offered in endless variety, but they have one outstanding characteristic in common—factory-freshness. Sales-minded wholesale bakers have found that making a good product is not enough—safe convoy to the table is imperative. *Protective Packaging*—sanitation plus retention of freshness and aroma over extended periods, has proven to be a magic formula for sales success in the baking trade as in many other food lines. Rhinelander Packaging Papers, converted into bags, wrappers and liners, are world famous for thus safeguarding edibles. When taste appeal and eye appeal are important to the product, salvation lies in retarding oxidation, rancidity, disintegration and odor absorption. To protect against such transgression, you'll find in Rhinelander's family of protective papers a grade best suited for the purpose.

RHINELANDER *Protective Packaging* PAPERS

Moisture/Vapor-Proof Coated Glassines
Wet Strength Glassines
Wet Strength Greaseproof
Heat Sealing Coated Glassines

Lard and Shortening Liners
Packing Industry Wrappings
Genuine Greaseproof
Specialty Bag Papers

Confectionery Papers
Cereal Wrapping Papers
Coffee Bag Papers
Cracker Box Liners

Laminated Greaseproof Papers
Wax Laminated Glassine
Greaseproof Innerwraps
Opaque Label & Bag Glassine

RHINELANDER PAPER COMPANY • MILLS AT RHINELANDER, WISCONSIN, U.S.A.

Appealing-Both
HEMINWAY
Heminway
Corporation
Factory—
Waterbury, Conn.
30 Rockefeller Plaza
New York 20, N. Y.
ROUND BOXES • SETUP BOXES • NOVELTY BOXES • PAPER CANISTERS • CATALOG PRINTING • PAPER DRAWN PRODUCTS

In BULK PACKAGING OF FRESH FOODS FOR AIR TRANSPORT

Since the "flying freight car" has become a reality, the luscious fruits and savory vegetables from far away places can now be shipped "farm fresh" to metropolitan dining tables, opening up new trade areas for growers; salt water seafood "fresh from the catch" may be enjoyed by those far removed from the ocean, with added advantage to fishermen. Coincident with this new development there has arisen the problem of securing a packaging material that is satisfactory for safe transport by air of these perishable products.

For bulk shipment of fresh foods by air or ground transportation, AQUASTOP'S exceptional qualities are more than adequate for complete protection. *Very light containers* may be used with AQUASTOP because this material is tough, flexible, durable and remains waterproof indefinitely.

Permeable to "dry ice" gas emanations, but impermeable to water from water-ice, AQUASTOP is safe at sea level or for altitude flying, protecting contents which it encloses without damage to other units in the same plane load. It is heat sealable, easy to use, practical, and profitable.

More than a packing case liner, AQUASTOP is, in many ways, a service in tangible form for economical and rapid application. Its makers are ever alert to change and trend, with an expert staff constantly probing into new packaging situations to find out what's happening and why, and what to expect—a continuous inquiry into everything of consequence in and to the business of profitable protection of packaged products.

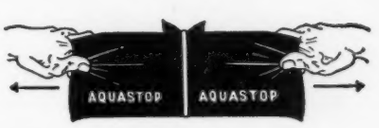
Ask us to show *you* how and why AQUASTOP can be as *valuable to you* as it has been to others. Just drop us a line, let us know your problem, and we shall be glad to go into action on your behalf.

No cracking

No tackiness

No flow

No loss of flexibility



The seal is as strong as the material itself.

Retains waterproofness

Permeable to CO_2

Impermeable to water

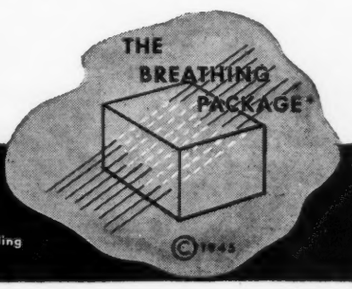
Withstands minimum hydrostatic pressure of 40 lbs. per sq. in.

Positive fool proof seal

PROTECTIVE COATINGS CORPORATION

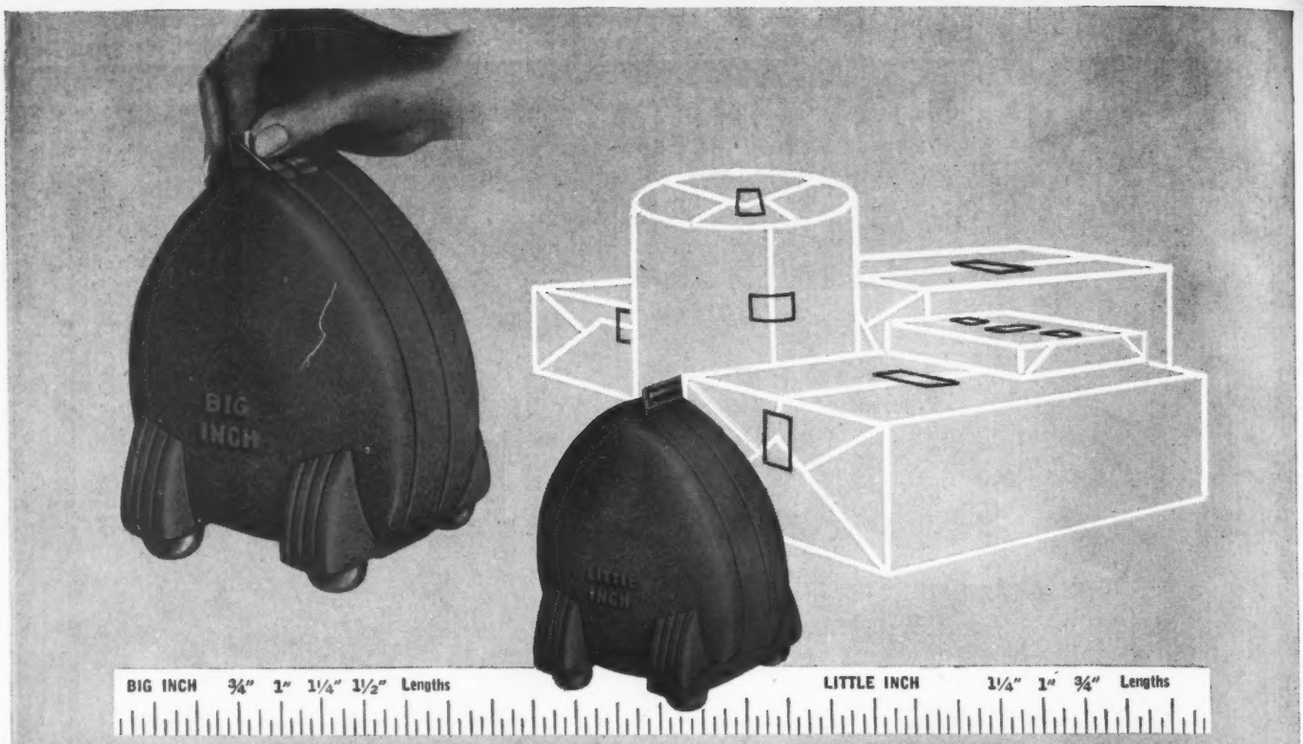
Manufacturers and Consultants

681 Main Street • Belleville 9, N. J.



AQUASTOP

*Pat. Pending



at last . . . MEASURING dispensers for PRESSURE-SENSITIVE TAPES

The new BIG INCH and LITTLE INCH dispensers offer the fastest, most economical method of applying tacky tapes—

MEASURES SHORT STRIPS—No waste! Measures and dispenses short lengths by simple adjustment. Less than half the tape ordinarily used provides secure sealing.

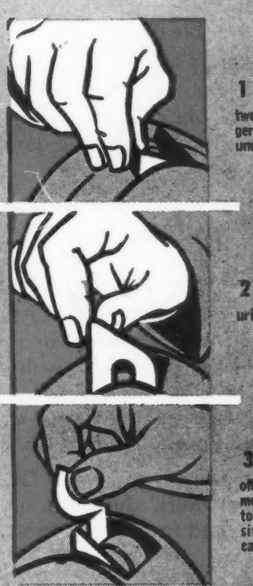
PROTECTS TAPE! Opens like book for loading tape securely inside. Every bit of tape is utilized.

SPEEDS PACKAGING! New style pickup leaves strip poised on fingertip, convenient for fast application (see illustration 3).

SAVES SPACE! Tape is dispensed upward. Less counter space needed. Weight prevents awkward sliding.

BIG INCH *takes 3" core rolls up to widths of 1", lengths of 2,592". Adjusts for ¾", 1", 1¼", 1½" lengths. Size: 7" high, 6" long, 4¾" wide. Weighs* 8 *lbs. 6 oz.*

LITTLE INCH *(similar in design) takes 1" core rolls up to widths of ¾", lengths of 1,296". Adjusts for ¾", 1", 1¼" lengths. Size: 4¾" high, 4¼" long, 3¼" wide.*



1 Grasp shuttle and tape together between thumb and finger, tacky tape-surface under thumb.

2 Pull up shuttle until it stops (measuring strip).

3 Release your hold on shuttle and tear off tape with sidewise motion. Tape adheres to thumb in proper position for rapid application.

PATENT NOS. 2,176,722; 2,362,640; 2,362,641

Better Packages, INC. SHELTON, CONNECTICUT

World's largest manufacturer of Tape Dispensers

BETTER SELLING BEGINS WITH BETTER PACKAGING!

Selling begins with the package, and better selling calls for A. C. M. Clay Coated Cartons. For these famous cartons give any packaged product a better *"sales front."* Their velvet-smooth surface, produced by an exclusive, continuous process, adds luster and brilliance to any design, makes it stand out in today's competition for eye-buying shoppers. Put your product at the head of the sales parade with a better package —an A. C. M. Clay Coated Carton!

AMERICAN COATING MILLS, INC.

Main Offices—Elkhart, Indiana.
Branch Sales Offices—Wrigley Bldg., Chicago;
271 Madison Ave., New York City.
Paper Mills and Carton Plants—Elkhart, Chicago.

MARKS OF A. C. M. SUPERIORITY:

Whiter board—
velvet-smooth surface—more rigid—
tougher—better folding qualities—
superior reproduction in either letter-press or lithography.

The Secret is in the SURFACE

AMERICAN COATING MILLS

A.C.M. CLAY COATED CARTONS AND CARTON BOARD

THERE GOES ANOTHER ROYAL CONTAINER

That's a different way of saying *"There goes another distinctive package"* because if it's a Royal bag or envelope, you can be sure it *stands out.* For two reasons—its *appearance,* particularly if designed by Royal, and its *efficiency* as a protective container.

If your product needs protection from moisture and air, it belongs in a Royal container made of a Royalflex film such as Pliofilm, Cellophane, metal foils, glassine and greaseproof or laminated materials. All of these aren't available at present but *now is the time for our art and package designing department to get busy.*

Tell us your problem and we'll get to work.

THE COOPERATIVE PACKAGE "FLAV-O-TAINER" HELPS SELL YOUR PRODUCT

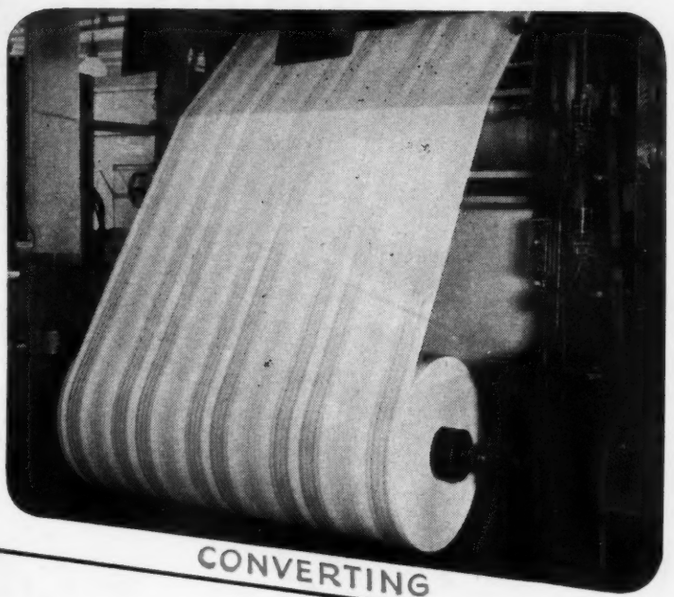
Most popular Royal Package is the FLAV-O-TAINER, a patented duplex, flexible container made with heavy paper outside and an inside lining of Pliofilm, Cellophane or any thermoplastic film—heat sealed on all seams.

THOMAS M. ROYAL & COMPANY • *Philadelphia 20*

BOSTON • CHICAGO • SAN FRANCISCO • BEAUMONT • ATLANTA • PITTSBURGH • NEW ORLEANS
DENVER • SEATTLE • NEW YORK • ST. LOUIS • DAYTON • DETROIT • SYRACUSE • BRYN MAWR

From the moment the woodsman's axe bites into the spruce tree . . . to the time the finished package is delivered to your plant . . . there are hundreds of individual factors that contribute to the protective and merchandising efficiency of that package. To you as a package buyer, it is of primary importance that Marathon combines all these "ingredients" of quality under one management . . . one integrated responsibility. By means of this integrated set-up . . . controlling all phases of supply, research, engineering, manufacture and service . . . Marathon "builds the package to fit the job" and delivers to you a consistently higher quality product.

MARATHON CORPORATION
Menasha, Wisconsin



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Integrated Responsibility

ASSURES YOU A HIGHER QUALITY PACKAGE

PAPER MAKING

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News about Marathon's pulp mill in Canada, now being built, will be announced soon.

MARATHON

First in Packaging for America's Foods

SO *Many* PIECES TO A PUZZLE

By scattering the manufacturing process you divide responsibility, weaken control and create a jig-saw puzzle. That is why we at Nashua have always insisted on doing everything we could for ourselves.

We convert papers and transparent film into the materials used for packaging. Our processes include waxing, coating, gumming, printing, embossing and laminating.

Furthermore, we maintain our own art, photo-engraving and stereotyping departments. We also grind our own inks. There is no puzzle to work out. Every process is coordinated. The inevitable result is uniformity and dependability, both vitally important to you.

CREATORS • CHEMISTS • CRAFTSMEN
NASHUA
MAKES PAPER MAKE MONEY FOR YOU

NASHUA GUMMED AND COATED PAPER COMPANY, NASHUA, N. H.

MODERN PACKAGING
VOLUME 19 MAY 1946 NUMBER 9

PHOTO DENNISON MFG. CO.

Suppliers of decorative packaging materials are shy this year about talking of gift packaging. The demand is so far ahead of the possibility of filling all orders that it's pretty embarrassing to talk about all the fine things they can make when they can assure only limited deliveries.

The usually simple matter of selecting and buying a pretty little box, a piece of ribbon, a transparent wrap is all involved in the complicated, after-war economic picture.

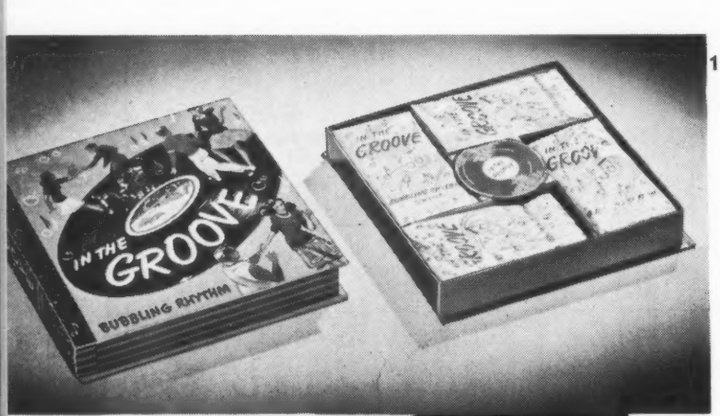
Leading economists estimate for the country as a whole an excess purchasing power of about 32 billion dollars bidding for goods and services in the 1946 market. Only when this excess is reduced by increased production can there be an approach toward a balance between demand and supply of goods. Such increased production, they argue, is dependent upon a clarification of national policies affecting price controls, wages and basic materials.

Only when these things are straightened out can the makers of perfumes, cosmetics, foods, lingerie, hosiery, watches, clocks, sporting goods, toys, candies, wines and liquors, tobacco products, stationery and other items heading gift lists hope to have an abundance of merchandise to sell or all the boxes, wraps and ribbons they want for packaging. Some forecasters say this will not be until 1948. Others are more optimistic.

In spite of this gloominess, MODERN PACKAGING predicts the most interesting year of gift packaging since 1941. Merchandise will be short, but what you see will be dressed in gala array that has not been seen for five years. Those manufacturers who are fortunate enough to obtain what gift packaging is available will make a splurge of frills and furbelows. Whatever they can get, they can use with a clear conscience. No longer is it on non-essential lists or needed for the "war effort."

How they are using it, as described on the following pages, will point the trends toward what will be seen on the store counters of the nation in the future.

Panorama of 1946 gift lines



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Best indication of gift packaging trends is revealed by the many glamour packages that appeared for spring promotions—Easter and Mother's Day—and in new lines that are being packaged for gift appeal.

Transparent containers, both drawn and molded, are being adopted with renewed zeal; others are being fabricated from sheet material.

Two new packages fabricated from sheet acrylic have been introduced for Constance Bennett's new perfume, "Impact" and Ronsard Perfumers,' "Mexicali."

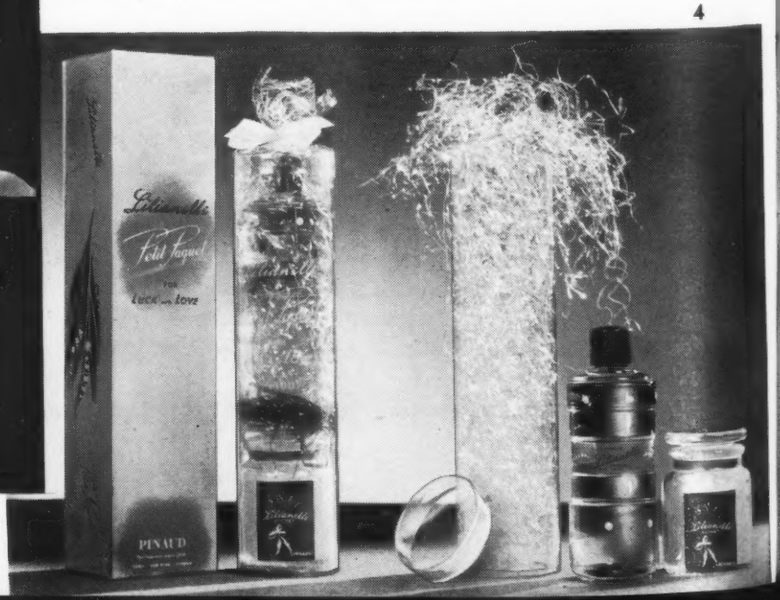
The Constance Bennett package is a set-up box. The base is machine grooved to hold the square fabricated lid. The bottle of perfume is secured by means of four pieces of the transparent sheet plastic cemented in upright position to the base.

The Ronsard box has a hinged lid and is designed for re-use as a transparent cigarette case that will accommodate either standard or king-size cigarettes. Hinge and lock are milled out of sheet stock. Hinge operates by means of a metal pin.

Pinaud's makes use of a cylindrical acetate container as a decorative housing for a gift set of its "Lilianelle" toilet essence and body sachet. Both glass containers are cushioned in shredded cellophane inside the transparent tube. The ensemble is then placed in a folding carton, appropriately floral-designed, for protection.

***1**—Bubble bath for teen-agers, called "In the Groove," is designed like phonograph album. **2**—Gift assortment of cheeses from Sak's, Middleton, Wis., in yellow box, cellophane wrapped, tied with cellophane ribbon. **3**—Gourielli collection in an acrylic bowl with many reuse purposes. **4**—Cylindrical acetate containers for gift set of Pinaud's "Lilianelle" combination, toilet essence and body sachet.*

(Page 88)



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Coty started the march toward postwar elegance by choosing a box with transparent acetate cover to give visibility to its new matched make-up gift set called "Vibrant." The partitioned box contains a box of face powder, cream-base make-up, rouge and lipstick in new postwar metal containers.

Esmé of Paris has on the market a "sachet menagerie"—"Gift Horse," "Sweet William the Skunk" and now "Ami Fidele," a poodle. An item like this—a hand-painted sachet with bottle of Esmé's "On the Avenue" perfume attached—is glamourized to the tune of a ten-dollar gift item when put in a pale blue transparent acetate box, ribbon tied.

Hottest news in the cosmetic field—predicted for a long time—is a spun aluminum container. First ones appearing are for Helen Liebert's men's toiletries called "Character." Two of these containers are used, one for after-shave lotion and the other for talc. A third container, for shave soap, is made of wood, decorated with aluminum paint. On all, the name of the product, "Character" is affixed by means of hand-cut script letters in 23-karat goldplate. Also, with a set of these containers the purchaser receives a molded transparent acrylic tray to hold the items. The items are packaged in handsome aluminum foil laminated cartons—mat finish outside with gold foil lining—which carry out the aluminum idea to completion of the package. Another feature is the plan to sell refills for these containers, each refill unit equipped with a tiny funnel made of .001 aluminum foil laminated to .004 vinyl film for the refilling.

No end of ingenuity is being used in developing ideas to intrigue women shoppers to buy men's toiletries. From California comes a series of some 15 different novelty containers for after-shave lotion, each a hand-painted bottle that resembles a humorous male charac-

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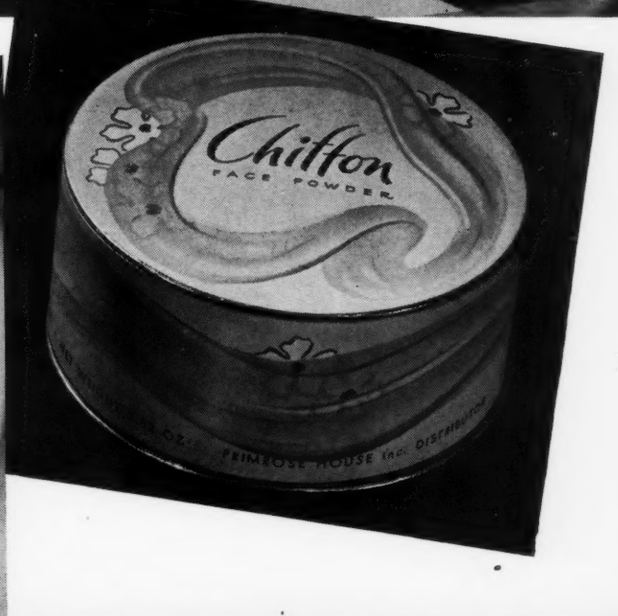

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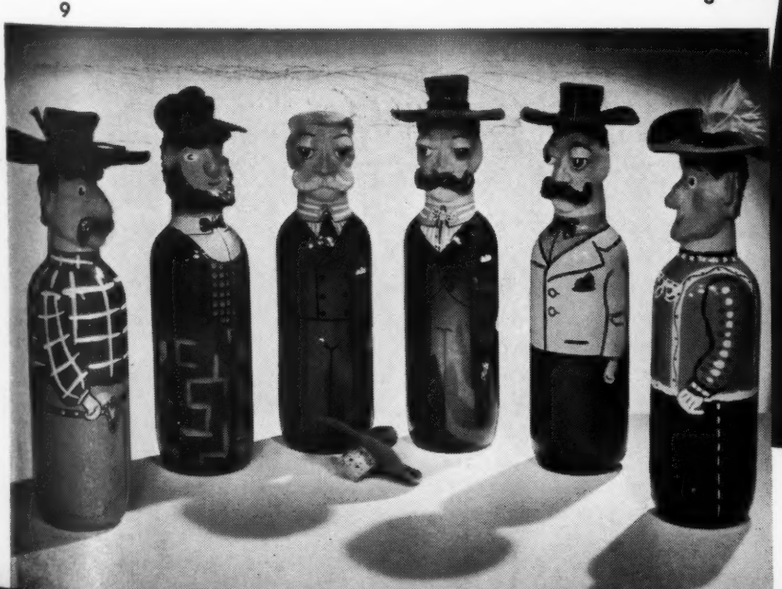

***5**—Loft candy box has removeable lid suitable for wall hanging.* ***6**—Same company also uses ivory and Wedgwood leatherette box with embossed orchid.* ***7**—Mirror vanity gift box is one of Loft's most popular sellers.* ***8**—Primrose House repackages "Chiffon" face powder with gift appeal.* ***9**—Bottles for Fenwick & Sailors after shave lotion have molded heads and felt hats applied to cork.*

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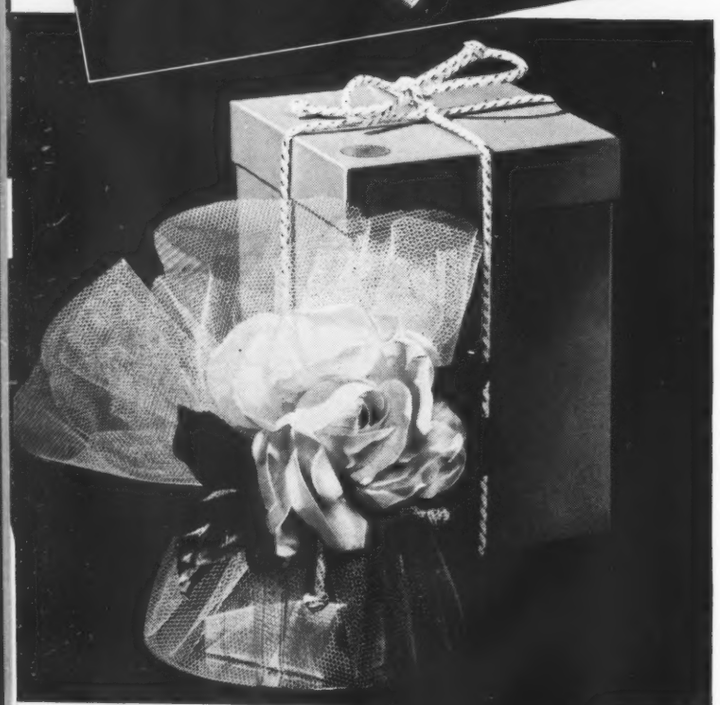

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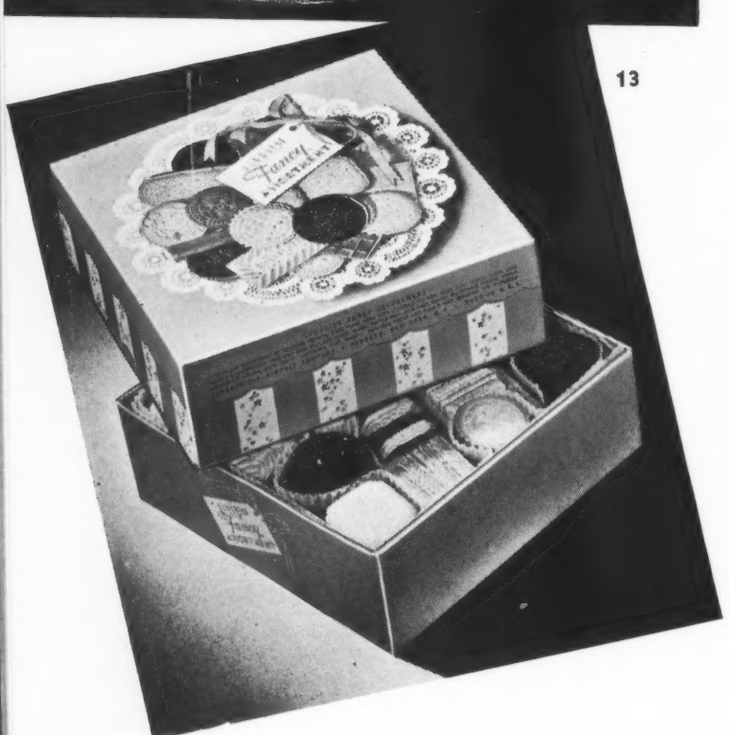

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10—*Coty chooses box with transparent acetate cover to give visibility to a make-up gift set called "Vibrant."* **11**—*Spun aluminum containers for Helen Liebert's men's toiletries. Foil laminated cartons carry aluminum idea to completion of package.* **12**—*Hattie Carnegie serves up her famous perfumes on a "silver platter." Silver-plated dish holds perfume inside frou-frou of tulle and flower.* **13**—*A colorful, year-round gift box of Sunshine cookies.*

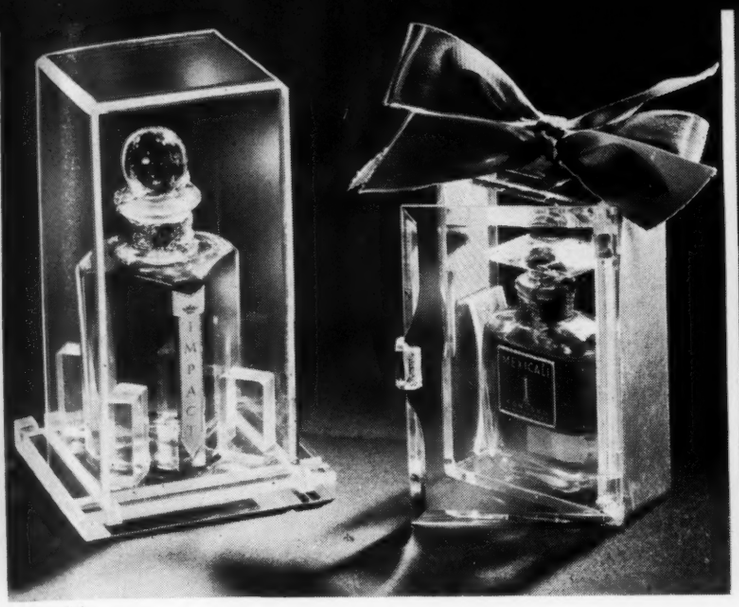
ter. Each of these bottles has a head molded of a plastic composition and a felt hat applied to the cork—hat design in keeping with the character depicted on the bottle. These bottles filled with after-shave lotion of Fenwick & Sailors, Hollywood, sell for the handsome price of $12.50 each.

Hattie Carnegie is serving up her famous perfumes "on a silver platter." The complete package is a blue box, 9 in. long and 6½ in. wide. Untie the cord, lift the lid and revealed is a cloud of tulle enmeshing a bottle of Carnegie perfume resting on a "silver platter"—actually a silver-plated dish the size of a bread and butter plate. Atop the frou-frou of tulle is a milliner's flower suitable for hat or corsage. Flowers are scented with the various Carnegie perfumes so packaged.

Another house famous for elaborate gift sets is Gourielli. What's coming for the Christmas season is hinted by this firm's Easter collection: an acrylic bowl with a dozen re-use purposes, holding perfume, body powder, sachets, hand lotion, bath soap all in Gourielli's famous blue containers and wrappings; a basket of fragrance called "Moonlight Mist"—be ribboned, be-tulled and with all bottles and jars of fragrance resting on shredded cellophane, and a "Something Blue" basket containing powder, perfume and a bath ball wrapped in tulle. Baskets are wicker, blue colored.

Everywhere in these luxury gift lines one sees a trend to more elaborate package decoration—an attempt to re-capture the elegance that was conspicuous by its absence during the olive-drab war years.

Even staple cosmetic lines are being prettied up to put them in the gift class, although these are being de-



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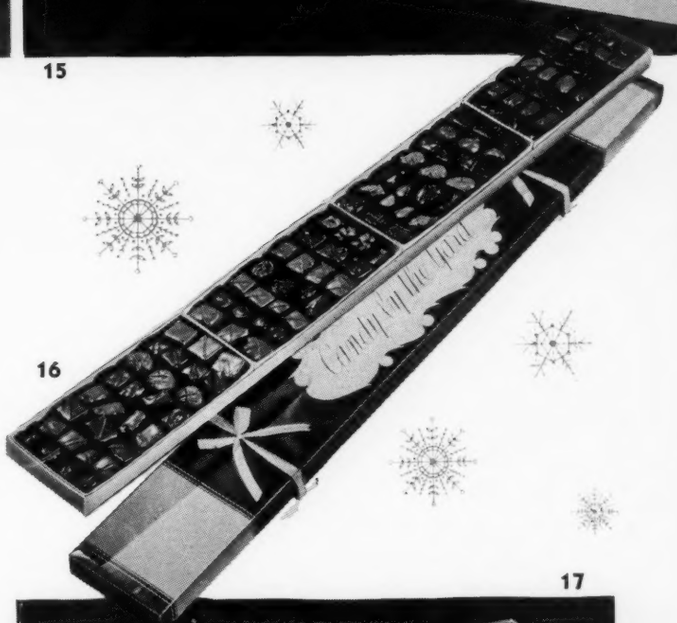
signed with sufficient restraint for adaptability to year-round merchandising. Primrose House has recently repackaged its "Chiffon" face powder. Previously this appeared in a simple box with no attempt at decorative effect other than product and brand identification. The new box introduces a new color note—yellow—into cosmetic packaging. The box is a muted shade that is butter yellow. The Chiffon motif in a bolder yellow threads its way over and around the box. Cream white primroses are half hidden in the folds of the Chiffon motifs. Lettering and trim are gold.

The teen-age cosmetic business continues to flourish and with it are many new merchandising ideas that stem from the package. From Los Angeles comes Julius V. Madsen's new package called "In the Groove." It's a package for bubble bath designated as "bubbling rhythm." It looks like a phonograph record album, the cover of which depicts teen-age, juke-box fans, done in four colors. Inside, the envelopes of bubble bath are arranged around a central disk resembling a record.

Despite sugar and chocolate shortages, confectioners are striving to keep candy high on the list of gift merchandise. Even companies who have designed excellent staple packaging are interested in novelty packaging with re-use appeal. It keeps people coming into their retail shops, they say, and keeps candy paramount in the shopper's mind as a gift suggestion.

Most progressive this year is Loft Candy Corp. A visit to any of their stores will reveal a wide selection of specialty candy boxes. They have found the mirrored box to be a popular seller and have decorated it beautifully with ribbons and hand-painted flowers. Construction of these boxes is also a matter of careful consideration—boxes that are made like small chests of drawers or that can be re-used as make-up boxes on the dressing table. Loft's has also adopted an interesting candy box that has a removable lid suitable for a wall hanging. These box tops are simulated wood with pictures affixed and lacquer coated to give them permanance. There is a wide selection of themes for these picture boxes—hunting scenes, ship pictures, snow scenes, florals and other still-life subjects. This company also



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14—Fabricated from acrylic sheet; left, set-up box for Constance Bennett's perfume; hinged box, re-usable as cigarette case for Ronsard Perfume. **15**—*Staple items become gift merchandise when attractively packaged—auto seat covers put out by General Motors in Canada.* **16**—*Lit Bros. famous "Candy by the Yard."* **17**—*Esmé of Paris' poodle and perfume in transparent ribbon-tied box.*

makes use of a number of leatherette boxes. All of these boxes are so designed for size that standard paper trays holding the candies may be fitted into them. The empty novelty boxes are stocked in the retail stores and filled at the store as required with fresh trays daily.

An amusing gift candy package is that which Lit Bros. of Philadelphia have back on the market after a four-year vacation. "Candy by the Yard" is the name of the package. In it are four trays of candy assortments and the over-all package measures a yard long.

The biscuit companies for years have made a feature of gift assortments of cookies. At this writing they were investigating the availability of lithographed metal boxes for this purpose, but due to the continued metal shortage may not get many.

Sunshine Biscuit Co. is featuring a year-round gift assortment in a colorful aqua and magenta box, on the cover of which is an appetizing color photographic illustration of the cookies it contains. Inside, the cookies are arranged in fluted waxed paper partitionings.

Cheese rationing for the past several years practically eliminated the packaging of gift cheese. The large national dairy companies formerly assembled such gift assortments for the Christmas season and will probably do this again as soon as supply permits.

In Wisconsin there are a number of small companies who make a specialty of packing gift assortments of natural Wisconsin cheeses and will guarantee shipment anywhere in the United States. An example is the gift package put out by Saks Cheese Co., Middleton, Wis. The set-up box is yellow with a simple line drawing of cheeses printed in black for decoration. The cheeses are wax dipped, individually wrapped in cellophane or foil for protection. Box is wrapped with cellophane.

Every year more and more staple items become gift merchandise by means of attractive packaging. In Canada, for instance, an interesting item treated in this manner is a set of automobile seat covers. This is a General Motors product and packaged in a colorful set-up box, identified with trademark and product name.

CREDITS: *"In the Groove" box, Hollywood Paper Box Co., Los Angeles. Sak's cheese box, Forsberg Paper Box Co., Madison, Wis. Gourielli: acrylic bowl, Hunton Plastics, Englewood, N. J.; blue bottles, T. C. Wheaton Co., Millville, N. J. Pinaud's: acetate container, National Transparent Plastics Co., Springfield, Mass.; cartons, Shoup-Owens, Inc., Hoboken, N. J. Primrose House: wraps, Addison Lithographic Co., Rochester, N. Y.; box, E. N. Rowell Co., Batavia, N. Y. Helen Leibert "Character," Reynolds Metals Co., Richmond, Va. Sunshine Biscuit box, Robert Gair Co., Inc., New York. Constance Bennett and Ronsard boxes: Blue River Plastic Mfg. Corp., Brooklyn, N. Y.; material, Plexiglas, Rohm & Haas Co., Inc., Philadelphia, Pa. General Motors box, Somerville, Ltd., London, Ont. Esmé of Paris: transparent box, A. & A. Rudnick, Inc., New York, and Warner Bros. Co., Bridgeport, Conn.*

Gift supplies . . . beautiful but scarce

18

When you think of gift packaging materials, your first thought is of decorative papers. MODERN PACKAGING contacted most of the leading manufacturers in this field for their comments on future trends.

Because of the supply situation it is not easy to point to any definite new design trends, they say, because so little has been done in this field during the war years. Most manufacturers have concentrated on a few staple lines that would be good the year round. High cost of plates and embossing rolls makes special or custom designs prohibitive for some customers. Some paper companies say the material situation is improved over 1945; others say it is worse and that it will be 1947 before there is any hope for abundant supplies. General opinion is for a supply to meet about 50% of demand. Some companies have ignored the request for comment entirely.

Hazen Paper Co. writes: "Materials back on the market include foils, still somewhat limited, and pyroxylin metallic gold and silver papers and their use as a base for embossed and printed designs. All are still in short supply.

"Design trends seem to be for quite colorful backgrounds or overprints in colors. The foils are decorated and embossed and will probably be in greater evidence: also imitation gold and silver foil papers.

18—*Seal sample, Cameo Die & Label Co.,* **19**—*Le Sonier powder mit box faithfully produced in Wedgwood blue.*

PHOTO CAMBRIDGE PAPER BOX CO.

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"We look to 1947 as a more normal season and the trend definitely seems to indicate more and more wrappings will be used."

Marvellum papers will be available in reasonable quantities for the 1946 Christmas season and this company says it has a number of new designs— limited of course, in quantity. They will take care of old customers first, and if any paper is left over will be glad to take care of new business.

Marvellum believes design trends point toward a more dramatic feeling—floral prints on a larger scale designed for importance. New techniques are free and color schemes employ up to four and six colors. There will be a generous use of metallics—gold and silver; navy, pinks and American Beauty shades used with turquoise, chartreuse and vivid yellow greens. There will be many combinations of coral and green, aqua with lemon and pink. All color schemes will tie in with trends in couturiere colors and high fashion trends.

"Like most everything else, decorative papers are difficult to get," said Kupfer Bros. Co. "The quantities of raw materials available to us have not improved." For this reason the company has hesitated to bring out many new items on poor quality base stock and are holding up on a number of new designs, which will probably not be released until 1947 or possibly 1948.

Matthias Paper Corp. says that a broad assortment of designs has been available, but sales have rapidly

20—*Flocked paper widely used for candy, jewelry and cosmetic packages. Sample, Kaplan Products and Textiles, Inc.* **21**—*Popular 1946 Poinsettia design, Hazen Paper Co.* **22** *and* **23**—*Metallics, back for the first time since 1941, in great demand. Seal and tag, The Foxon Co.*

caught up with potential maximum production. They feel the trend points to an increasing use of papers with designs suitable to the Christmas season, but sufficiently general to serve for year-round use.

Flocked paper—the material with the appearance of a suede finish—has gained great popularity during the war years because it has been an excellent alternative in the absence of satins, taffetas and other textile box coverings. Kaplan Products & Textiles, Inc., a leading manufacturer of this type of paper which they call "Plushtex," say it is being widely used for candy, jewelry and cosmetics packaging, and for display cartons. They claim it eliminates costly handling and installation required for textile coverings, since it can be handled on paper machinery. In small but reasonable quantities, it can be made fast to any special color, so that the designer can procure exactly what he wants and is not limited to stock colors.

Here and there one finds a venturesome manufacturer who is promoting a new material. Taffel Bros., Inc., ribbon suppliers, have announced a new embossed foil wrap called "Babyland," recommended for "gifts that follow the stork," although appropriate, too, for Christmas use. This paper-backed foil, which has an embossed pattern of toys, babies and gift boxes, comes in red, silver, pink and blue. It is packaged in 50-ft. rolls, 26-in. wide, recommended for gift wrapping materials to be used in infant's wear departments and children's specialty shops.

Because of the supply situation, cellophane and foil converters expect only a limited use of these materials for the holiday season.

Shellmar Products Co. is offering a series of stock holiday bands and wrappers, color printed on cellophane. These will be offered on a "first come, first served" basis, they say. Volume will not equal pre-war years simply because of the limitations on production. Sales volume could easily double or treble the best pre-war years, however, if material were available.

In addition to cellophane bands and wrappers, Shellmar says, there is a great demand for holiday packaging in the form of wrappers, sleeves and cartons, as well as bags and envelopes, fabricated from various transparent films or from laminations of these films to either paper or boxboard. Shellmar's comments on design indicate a trend to simple handling of line and color. Effects will be bold, the company says, with a predominant use of heavy masses of color. Red is the predominant holiday choice with blue and white, particularly in combination with metallics, receiving a great deal of favorable attention.

Milprint created many pre-war Christmas packages, and with lifting of war restrictions, plans to enter this field to the fullest extent that availability permits.

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24—Embossed foil wrap called "Babyland," suggested for gifts that follow the stork. **25**—*Imported metal novelty containers from England, available in limited quantities.* **26**—*Decorative cellophane wraps for hams and other items dress up staple goods for dealers' holiday displays.*

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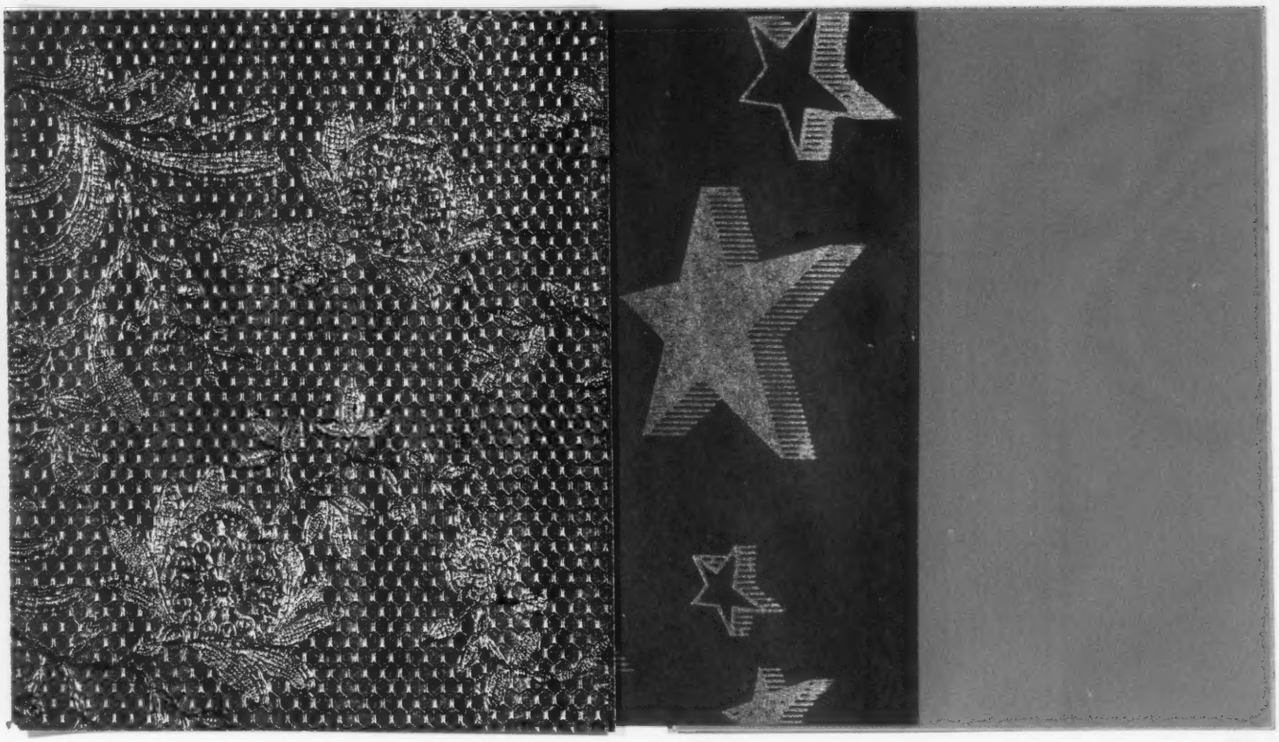

27 28 29

***27**—Metallic, embossed Valenciennes lace pattern is old favorite, Kupfer Bros. Co.* **28**—*Star design, suitable for Christmas and year-round as well, Matthias Paper Corp.* **29**—*Plasticolor, a new box-weight paper, combined of acetate film and 50-lb. label stock—soil resistant and may be embossed, The Dobeckmun Co.*

They are making printed cellophane suitable as overwraps to decorate regular cartons, boxes or other packages. This method of dressing-up regular stock for the holiday season has many advantages, since the retailer can easily remove the holiday overwrap on any stock left over and use it as regular year-round merchandise. Milprint is also making decorative cellophane wraps for hams that put them in the class of gift merchandise and dress up the dealer's shelf. A circular printed cellophane wrap suitable for cakes and pies is also a novel gift idea. This company also offers a wide variety of printed cellophane bands, which, placed around almost any package, can add the festive touch.

Milprint is also anticipating a strong demand for foil as an eye catcher and has several samples adaptable to many gift packaging applications. This company's "Milcote," a coating that gives high luster and gloss to the printed sheet, either litho or letterpress, is a war development that will have many applications as a wrapping and box covering material to enhance gift lines as well as year-round packages. This material has heat-sealing properties.

Box makers, for the most part, are in the same position as the suppliers of papers and transparent types of wrappings. The S. K. Smith Co., a leader in the novelty box field, writes: "We're thoroughly sold out for 1946 and we're not accepting any more volume for this year."

Old Dominion Box Co., with nine plants in the South believes the gift box situation for 1946 to be a bleak one.

Many companies are taking care of their old customers and are designing some interesting new things, but of course cannot release information about these until their customers put them on the market.

Cambridge Paper Box Co., however, puts the shoe on a different foot. "In our opinion," says this company," it is more a question of whether the designers and producers of packaged merchandise can deviate from their existing abundance of business to develop special Christmas lines. It will be unfortunate if many are unable to do so.

"Our company is pleased to go on record as follows: that this Christmas should be a most enticing and gala one as far as the availability of box covering material is concerned. Although many textiles are practically extinct for external covering, for those who plan in advance, delightful coated papers are available."

In contrast with the designs of 20-odd years ago, new designs seem more refined, this company states. Colors are more authentic and uniform and blend delightfully with fashion colors. They believe there is increased consciousness for improved packaging in staple merchandise as well. With the increasing availability of foils and synthetic coatings which are outcroppings of functional war papers, they feel there is an enormous and varied source of box coverings.

A bright note was also sounded in the field of rigid transparent containers by Central States Paper & Bag Co., Inc. This company expects to occupy its new building in St. Louis about July 1 which, they say, will increase their present production of "Showboxes" by about 10 times. New machinery is being built to take care of this production and to make rigid transparent

boxes of many types at higher speeds which eventually should decrease the cost. This company says it is obtaining satisfactory quantities of cellulose acetate and feel that they have good prospect of supplying a fair portion of the Christmas demand.

This company makes many of the unusual shaped transparent boxes in the shape of Christmas bells, hearts, etc. They are very much interested, too, in developing the rigid transparent box market for utility as well as gift packaging.

Metal boxes are scarce as hen's teeth. Therefore it was of considerable news when Imported Delicacies Co., Inc., announced a supply of imported novelty metal containers from England. These containers are available in a number of sizes and shapes and finished by special process in interesting design and full color. They are suitable for candy, cosmetics, cookies, jewelry and other novelties. Supply, is already below demand.

Makers of ribbons, ties, tapes, seals and tags have many beautiful items for the Christmas trade, but most all of them in limited quantities sold on a "first come, first served" basis. Cameo Die and Label Co. and The Foxon Co. are showing many exciting numbers profusely printed with silver and gold. Other companies have similar items in limited quantities.

In regard to Christmas tapes, comments from International Plastics Corp. are quite typical. This company has broadened its line of Christmas tapes, offered in popular widths and lengths. They will also individualize these tapes by the imprinting of manufacturer or store name. Fibre Cord Co. is featuring colored cellophane ribbons.

One of the most enthusiastic responses to MODERN PACKAGING's quest for gift packaging trends comes from Dennison Mfg. Co. Because of this company's leading position in packaged wrappings for retail over-the-counter sales, these comments are significant.

Dennison believes the supply situation is better, even though the company is still selling in limited quantities. Their 1946 line includes a wide variety of packaged gift wrap designs, seals and tags, cellophane and ribbon. They believe the public is always traditionally minded on the matter of Christmas design. People want gift wrappings to feature familiar motifs—Santa Claus, poinsettias, candles, snow men, bells, holly, snowflakes and the rest. But they want them treated in a modern manner. Dennison has tried to meet these demands and has employed leading artists to design its Christmas wrappings in accordance with these preferences. Because of the use of water color inks, they claim their products have added brilliance and are rub- and moisture-resistant. High gloss inks on high gloss paper, they say, give added luster to their tags.

Dennison is also proud of introducing what they claim are the first matched lines of gift papers, seals, tags and cards, packaged as sets. A lithographed merchandising unit has been planned by Dennison dealers to display gift wrap packages.

Store gift wraps in 1946

Department stores throughout the country have been divided in their attitude toward gift wrappings. By agreement in certain cities, even before the war, some stores had dispensed with store gift wrappings. However, such agreements are difficult to maintain, since some stores will not abide by the rulings, preferring to use a distinctive gift wrap for its promotional and prestige value. In the future many stores may again adopt such wraps, it is believed, if competitive merchandising demands it.

In Metropolitan centers like New York, many of the more exclusive stores before the war used very elaborate wraps, sometimes printed foils or printed cellophane. One store even used printed cellophane with a colored slip sheet. Some stores have had special wraps for Easter and other seasonal promotions.

Most stores, even though they do not have a special gift wrap, will use special holiday boxes for packaging Christmas merchandise. This practice was maintained by many even during the war. The Christmas box facilitates packaging in that it requires no further wrapping but a string. The customer carries it home and the colorful box acts as a promotion for the store.

In addition to store gift wraps, many progressive stores have maintained special gift-wrapping service departments, where they will put a special wrap on your package for a nominal fee, the price being in accordance with the type of wrap you select.

Altman's in New York has an extensive new service of this kind in its specialty food section. Displayed are a number of gifts—for birthdays, for going-away presents, for hospital gifts, etc. The customer selects the gift and wrap he wants at the price listed for the displayed samples.

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30—*Neiman-Marcus Easter wraps, specially designed with all-over pattern of colorful Easter eggs. Feature of Easter promotion was a hat made into a package so that the crown would hold whatever gift the customer selected. Hat packages were shown throughout the store with gift merchandise.* **31**—*A box wrap showing a bow-tie, collar and buttons is current Neiman-Marcus gift wrap for men's department. Round "Happy Birthday" wrap carries phonograph recording of "Happy Birthday" attached to box lid.* **32**—*Lithographed gift box wraps in red, yellow, green and black on white stock used by the Walker Stores in Canada.*

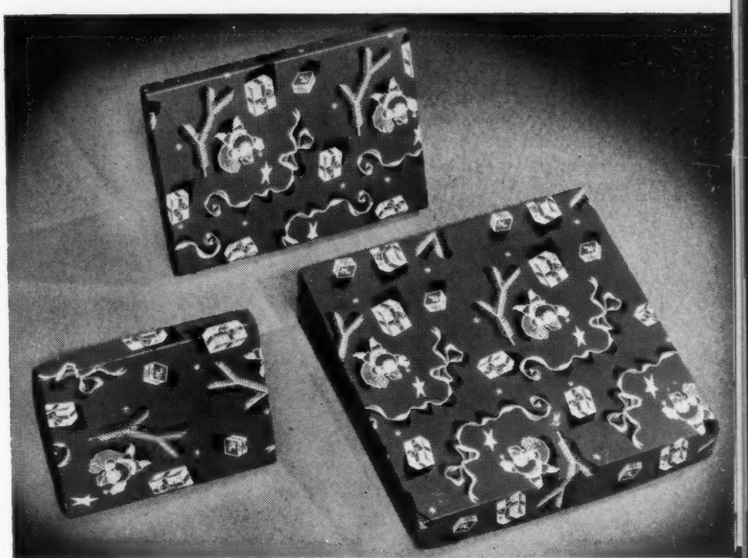

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PHOTO SOMERVILLE, LTD., LONDON, ONT.

The store which has gained nationwide publicity however, for this kind of gift wrapping service is Neiman-Marcus in Dallas, Tex. No gift packaging forecast would be complete without a report of what is being done there. This store offers gift wraps which range in price from 25 cents to $35 and employs regularly not less than three girls to do special gift wrapping and at Christmas time has had as many as 90 people in its gift wrapping service department. In spite of wartime shortages, this firm has maintained its gift-wrapping service. They used whatever was available and said gift wrapping was not a matter of what materials you could get, but what ingenuity you could apply to create distinctive wraps with whatever you had available at the time.

Neiman-Marcus gift-wrapping service is continuing on as large a scale as ever. For the Easter season, this store used a special wrap—a paper designed with colorful Easter Eggs. The novelty of the season was an Easter Hat made so that the crown would hold whatever gifts the customer selected—cosmetics, handkerchiefs, candies, etc. The whole was flower-and-veil decorated, just like a real Easter bonnet. The Easter hats were used as promotions throughout the store with gift merchandise in all departments.

Handkerchiefs made into dolls have been used extensively as packaging adjuncts at Neiman-Marcus and are designed to compliment the merchandise when it is gift packaged. For example—Texas Pecandy, a Texas made candy, that has a cowboy design on the cover is accompanied with handkerchief dolls dressed to look like cowboys and cowgirls.

Latest use of the store's "Happy Birthday" wrap—a paper which carries a design of the music and words to this song—has been on a round box which has a phonograph recording of "Happy Birthday" attached to the lid.

A special package designed for the men's wear department is a box wrap that shows a bow-tie, white collar and buttons similar to a man's shirt.

In the large cities, too, there are today occasional small shops which specialize in decorative gift packages. The Guildery in New York is one of these. Here you may go in and select a gift suitable for any occasion and have it wrapped according to elegantly displayed samples. Some of these shops will also do custom packaging in the decorative gift field and can perform an excellent service particularly for packaging that requires much hand work in the tieing of ribbons, attaching various individualized touches, etc.

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1—*Box may be functional part of toy. Kitchen set of plastic furniture made by Plastic Art Toy Corp. of America is housed in box that forms a miniature kitchen.*

Toys demand better pre-packs and eye appeal

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The toy business was hit hard by wartime shortages. Generally considered in the non-essential category, this industry not only had to do without materials for making toys, but had practically no choice of packaging materials.

Now, when toy manufacturers can plan for the future, they are expressing wide interest in improved methods of packaging. One of the most discussed subjects at the recent Toy Show in New York City was packaging. Toy makers want better structural packaging, which they sacrificed almost completely due to limitations on paperboard. And they are scrutinizing their packaging seriously from the standpoint of improved merchandising.

To understand the packaging requirements of this industry, it is necessary to know something about the nature of the toy business. In the first place, toys are highly seasonal. The bulk of selling must be done in six weeks before Christmas, when every store is turned inside out to make room for the seasonal quantities of

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2—*Corrugated board makes this pre-war container a hanger and carrying case for toy planes. Further development will be seen in this field.*
3—*Wannatoy puts plastic trains in box that opens into railroad station; plastic boats into box that forms marine filling station, yacht club, complete with wharf.*

(*Page 98*)

toy merchandise and to accommodate traffic in toy departments which includes practically every member of the shopping population—mothers, fathers, kids, aunts, uncles, cousins. Sales forces are augmented with green help—all to take care of the panic of selling that keeps up at fever pitch until the closing bell on Christmas Eve. Then it's over for another year, except for slight seasonal spurts at Easter and around Fourth of July.

The better the toys are packaged to facilitate handling during this rush, the better store operators like them. Nowhere in a store is the factory pre-pack—well identified for color, style, model, etc.—more appreciated than in the toy department at Christmas. It saves wrapping, breakage, mistakes and hours of time.

Toys, too, depend on novelty. What's good one year, may be dead as a doornail the next. The average life of a toy business is three years, according to authorities in the field, with the exception of well-established staple lines, such as electric trains, certain lines of dolls, standard games, structural toys, doll carriages, tricycles, sleds, etc. Even for these, styling is all important. A locomotive that looks like a 1910 model may interest Dad, but it won't catch the eye of Junior. He wants streamlined, Diesel-looking jobs. His sister wants dolls dressed like she does, or like Mom or her older sisters. Toy furniture must simulate the design of furniture children see in their own homes. All of this has its effect on the styling of the package.

Hundreds of toys are sold by demonstration. The appearance of the package as a sales tool is of no importance, so long as it is structurally efficient to protect the toy and serve as a pre-pack for easier handling in stock rooms and by sales forces. The shopper wants to see how the toy works or how it looks. Electric trains and all kinds of mechanical toys are in this cate-

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4—Noma has done a good job of identifying package with trade name. Wood-grain effect of box design suggests Noma wooden toys. **5**—*Kebs, Inc. packages its Trudy doll, sealed in cellophane and in gay pink and blue striped box—tamperproof and a pre-pack.* **6**—*Die-cut platform in two-piece folding carton offers good protection for McKee glass cooking ware.* **7**—*Pre-war, Aluminum Mfg. Co. put dishes in useful carrying carton.*

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gory. Pop wants to see the trains go, or he wants to wind up the spring in a toy merry-go-round himself to see it go around. The container doesn't matter.

The container is important to the manufacturer, however, if he is the maker of a staple line, because the box can carry his trade name to the home of the consumer and he is as anxious as the manufacturer of foods or cosmetics that his product be remembered by the trade name on the box. The container is also important to the store in that it be a satisfactory pre-pack that can be taken out of stock and sold with assurance that the toy it holds is marked correctly for style, model, color, etc., and with assurance of a factory guarantee that it will work. Store buyers are much more apt to re-order, another season, staple toys from companies whose lines they know are reliably pre-packed and mean few returns because of faulty merchandise. The package can help foster such confidence.

Whem Mom and Aunt Jane go shopping to buy a Christmas doll for little Sister, they want to see the doll, how it is dressed, what kind of hair it has, how its body is constructed, whether its eyes close, etc. Dolls are usually boxed, but the boxes are of little importance in appearance unless they are made as miniature suitcases which can be re-used by the child. These gained great popularity before the war and were often used to sell not only the doll, but wardrobe with it.

If the box is not a re-use box, however, it should be made sufficiently strong to protect the doll from damage. Store buyers and container manufacturers both say that doll manufacturers often have selected boxes too flimsy to protect the dolls. More and more, these boxes are being used as pre-packs—that is, the store sells the dolls from counter samples and gives the customer a fresh doll from stock. Therefore, it is essential that the boxes be of such construction that they protect the doll from breakage or handling. Broken boxes mean damaged merchandise and consequent loss of sales. Leading doll manufacturers are beginning to realize that good packaging is a way to win good will for their products and are using strong boxes well identified with trade names. Better dolls are also often trademarked with tags affixed to the doll itself as a means of building good will and promoting brand.

Infant toys and toys for very small children present an entirely different packaging problem. Usually these are soft toys, or rattles, balls, etc. Cellophane and other transparent materials have had a tremendous appeal for such packaging. The sales appeal, besides visibility for the toys, is cleanliness. Nobody wants to give a handled, shop-worn toy to a baby, who puts any-

8—*Toys must be packaged with timely appeal. Example is this new electro-mechanical educational game, "Radaronics."* **9**—*Jonthay's jack-in-a-wood-box tells a story of Nosey, the character it contains.* **10**—*Toy departments feature adult games. E. S. Lowe chess set comes in leather box that looks like an antique book with history of chess and directions as pages in the book.*

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11—*Staple games are packaged with eye appeal, but brand identity is important. Note E. S. Lowe trademark on these.* **12**—*Russell's Library of Games fits in compact die-cut set-up box with windows.*

thing and everything in his mouth. Mothers, therefore, want toys that are clean for their babies. They also want toys with fast colors and dyes that are not injurious. Wise toy makers have been quick to recognize this fact. Many have put their toys in a transparent covering, such as either cellophane or, in some cases, rigid transparent boxes. They have also tagged and labeled their merchandise to say that the toy has been sterilized and that it is washable, that colors are fast and harmless. The war shortages of packaging materials have curtailed some of this type of packaging, but it will be back as soon as materials permit. Such packages are usually heat-sealed to make them tamper-proof, to assure a factory-fresh product.

For larger toys, furniture and vehicles of all kinds, there is a trend toward the packing of these items in partially knocked-down state, leaving it to Pop to set them up on arrival. Such packaging is usually done in corrugated boxes or board. This practice has gained favor because of the saving of space and shipping costs. This practice also means a saving of labor to complete the toy and consequently a saving that can often be reflected in the retail selling price of the toy to the consumer. Aside from the requirement of good packing that will protect the toy in shipment, such packing requires careful attention to the detail of assembly so that all parts are included in the package and also careful inclusion of details for putting the toy together. In the past, some of this information has been too sketchy and unless Dad was an engineer it was no easy matter to put the pieces together.

The greatest scope for the package designer's skill in the toy field is in the planning of packages for counter sales in a toy department. This covers all boxed educational toys, games with timely interest, the

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13 *and* **14**—*Every boy knows Gilbert Erector and Chemistry sets. Boxes are made strong for permanent use and well identified for brand.*

"blood and thunder" toys for boys from 5 to 12 years old and the sets of dishes, sewing kits, beads, weaving, dress-making, miniature furniture, etc., for little girls.

Usually these toys are planned for impulse sales. The shopper doesn't know what he wants, but scans the counter to find something different. His eye is attracted by the exciting illustrations in color on the covers or by the merchandise displayed in die-cut boxes.

A trend gaining popularity is the use of these boxes as functional parts of the toys. Several examples are illustrated with the article. In one instance a new set of plastic furniture includes all the items used in a modern kitchen, boxed so that the container itself sets up to make the walls and floor of the kitchen. The box walls, by means of color printing, resemble a room with windows, wallpaper, shelves, etc. A printed sheet is included to form what appears to be linoleum for the kitchen floor. Another illustration shows a set of plastic toy boats packaged in a folding unit that opens into a yacht club and marine filling station for the motor boats, complete with wharf. Another box for a plastic train set, when opened, forms a third dimensional set-up resembling a railroad station complete with overpass and tracks over which the trains may be pushed. Such ingenious boxes offer a plus value to the shopper and fun for the kids.

More and more attention is being paid to designing covers for such packages illustrating children of an age for which the toys are suitable. This is helpful to the shopper, who is usually an adult looking for a gift suitable for a child of specific age and sex. Attention has also been paid to colors and surveys have been made to determine what colors children like best, although these were perhaps too tentative to indicate any definite trend under all conditions. (See MODERN PACKAGING, July, 1945, p. 116.)

To gain attention on the counter, there has often been a tendency to place the toys in boxes much larger than the assemblies require. For example, one box maker told us that manufacturers of toy dishes put little sets of dishes in die-cut platforms fitted into flat set-up boxes much bigger than the sets require. Usually the boxes and platforms are so flimsy they scarcely protect the dishes. His contention is that more attention should be given to the structure of the boxes and an attractive unit that would give equally good counter appeal, yet save counter space for the store and permit more strength at the same cost for the packaging.

The toy industry is so diversified that it demands a thorough study of all the basic principles of packaging, covering protection, economy and eye appeal.

Smart toy manufacturers are thinking about these factors and several alert designers are giving much thought to the use of the package as the proper sales tool in a highly competitive industry that means an annual business of millions during a six-week period.

ACKNOWLEDGMENT *to the following for their special help in the preparation of this article: Robert Gair Co., New York; Hinde & Dauch Paper Co., Sandusky, Ohio; F. N. Burt Co., Buffalo, N. Y.; Alan Berni, New York, designer of the "Wannatoy" packages; Eugene Luz, New York, designer of the Plastic Art Toy Set, and the many toy makers who loaned material for photographing.*

15—*Old stand-bys like Rook and Pit are popular year in, year out. Parker Bros., Inc. guard carefully their registered trade names and pay much attention to attractive design to win continued counter sales.*

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Grower packaging of produce

. . . California leads the way

With forceful emphasis on the logic of pre-packaging fresh fruits and vegetables at the point of origin, two independent organizations of California and Arizona growers are currently launching simultaneous long-term pre-packaging projects.

Each of these operations is completely unrelated and independent of the other. One is a *marketing* setup; the other a *research* project, with marketing to be on a test scale only. Their success can alter the entire structure of our massive fruit and vegetable industry and bring revolutionary changes in affiliated industries—carriers, refrigeration, machinery and packaging materials.

One of these projects, "Cal-Co-Pak," is being set up by the California Cooperative Packaging Assn., a strong group of nine grower-shippers. It is purely commercial in character. Collectively these men produce, pack and ship about 45,000 carloads of deciduous fruits, vegetables and melons annually. In their pilot plant now under construction they will begin their operation with consideration of methods, machinery and materials which have up to this time proved most successful in the pre-packaging and refrigeration of fresh fruits and vegetables.

Through their cooperative association they will market their pre-packaged products under their own brand name to established outlets who agree to maintain for the consumer the original garden-fresh quality of the product through continuous refrigeration. Going on from there they expect to develop refinements and improved over-all methods which will lead to expanded capacities capable of handling the pre-packaging and distribution of the bulk of their products.

In contrast to this operation, the other is exclusively an industry research project—an important fundamental difference emphasized by the officials of both organizations. Set up on a non-profit, non-commercial basis, it will be operated as the Western Growers Experimental Institute by the Western Growers Assn.

The active membership of the Western Growers Assn. includes something over 90% of the vegetable and melon grower-shippers in California and Arizona. They produce and ship to the markets of the United States and Canada more than 200,000 car-lot shipments of these products each year.

The pre-packaging division of the Institute is to be a completely equipped pilot plant operated with the cooperation of leading agricultural scientists, biochemists, engineering and research talent from various manufacturers, universities and rail, truck and air carriers. This will provide for the first time a laboratory for trial-and-error experiments all the way from harvesting fields to consumer—experiments which are expected to develop practical, test-proved, low-unit-cost methods of pre-packaging produce which can be profitably adopted by individual grower members in pre-packaging their own products and shipping them to distant marketing centers.

Notwithstanding the difference in the primary purposes of the two groups, it must be said that each is aiming for the same ultimate objective—that of placing before Mrs. American Housewife, wherever she may buy her food, garden-fresh fruits and vegetables either pot clean or ready to serve, which are packaged *by the farmer* under brand name in attractive, labeled packages.

As to the formulae by which this objective can best be reached, the two organizations are in complete agreement on a number of fundamental issues. They are both convinced that in addition to the package, complete refrigeration from field to table is vital to the success of pre-packaging—that dependable, sure methods of maintaining proper temperatures are essential to high *quality* control, a "must" if pre-packaging of fresh farm products is to accomplish its purpose. The two in-

1—*C. B. Moore (right), managing director of the Western Growers Association, and Lindsey W. Cochran, a produce grower, examining some of the pre-packaged produce items displayed at a recent meeting of the Association.*

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terested groups are in complete agreement about the time and place for pre-packaging: by the grower at the time of harvest. The elimination of all bulk waste such as trimmings of tops and leaves at the point of origin before shipment; reducing to a minimum handling of the produce and the waste which results in damage from mauling by packers, carriers, wholesalers, retailers and finally the consumer; the value of inducing proper refrigerated temperatures at the moment of harvesting, before deterioration begins—these are among the obvious advantages indicated by pre-packaging at the point of origin.

All leading authorities who have studied and experimented with pre-packaging of produce—both in the West and East—have agreed on this ultimate objective. Its acceptance by the growers has, up to now, been in doubt.

If the produce-growing industry generally becomes a packaging industry, the potentialities and the challenge to packaging will be tremendous. It will bring actively into the packaging picture a vast industry which previously has had little or no concern with it. Growers, large and small, will have to be educated in sound packaging practices and taught the value of trade names and eye-appeal design. It is almost a virgin field for packaging development, and since it means no added cost to the consumer—but undoubtedly lower costs through elimination of waste and spoilage, together with a better product—it is one of the finest examples of the economic benefit of packaging.

The Great Atlantic and Pacific Tea Co., whose Columbus experiments have perhaps been the most extensive and convincing to date, are among the strongest advocates of moving the packaging operation clear back to the grower[1] at the point where produce is grown.

From 20 to 30% of all the food our farmers produce is estimated to be lost through what is termed by agricultural economists "normal wastage." A. L. Martin, Director of Research, Distribution and Marketing for the Western Growers Assn., stated in a recent address: "If pre-packaging—with pre-packaging's attendant blood-brother, 'proper refrigeration from point-of-origin to the consumer'—reduces this appalling waste as much as 25%, the resultant saving will more than pay the cost of pre-packaging."

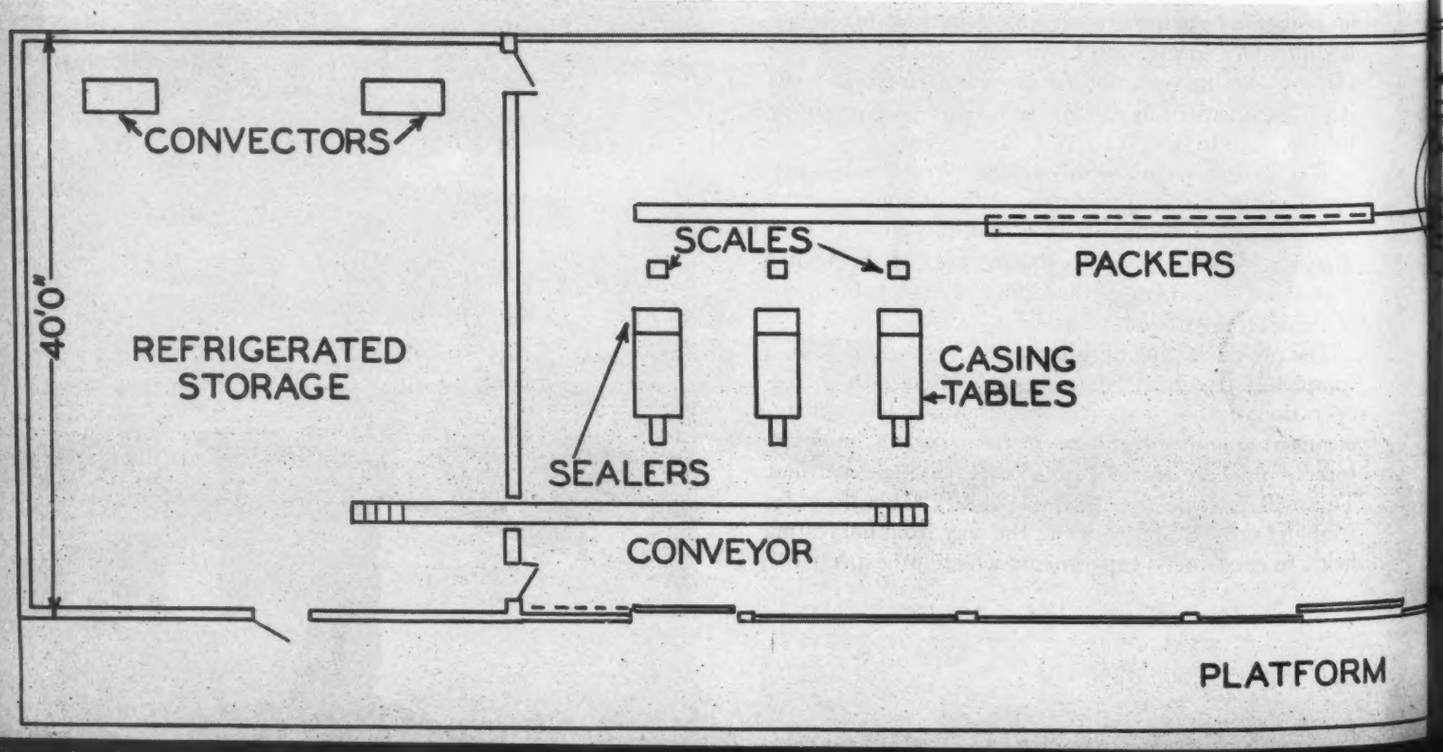
Some idea of the savings which are manifested in proportionately greater payloads can be gained from the fact that when carrots are pre-packaged and shipped with their tops off the saving in the transportation cost of the load will be 26%. Cauliflower pre-packaged with the jackets removed will effect a transportation cost saving of 50% of the load. Lettuce, when pre-cooled to about 35 deg., packed in proper containers constructed to permit free circulation of air and stout enough to withstand the required weight, and loaded into one of the new-type fan-equipped refrigerator cars, will cross the country at a minimum payload rate based on 28,000 lbs. as against a present rate based on a minimum of 20,000 lbs.

Another point of agreement between the two California groups places the emphasis on development of new types of containers. Many of those now in use are cited as being too expensive, too heavy and too cumbersome for some commodities as they will be packaged in the future. Mr. Martin feels that no one manufacturer of packaging material has, or probably ever will have, sufficient production capacity to supply more than a

[1] See "Packaged Produce," MODERN PACKAGING, July, '45, p, 89.

2—Operation plan of the pilot pre-packaging plant being set up by the California Co-Operative Packaging Association indicates the thinking of growers who are going into packaging on a large scale. This plant, which is to be located in Los Angeles, will soon turn out 60,000 lbs. of packaged produce daily.

(*Page 104*)



fraction of what the industry will need. He also feels it is quite probable that no one type of material will be suitable for all commodities.

Western Growers Experimental Institute

The Western Growers Experimental Institute is the culmination of almost two years of study by a research committee under the chairmanship of E. M. Seifert, Jr., of Salinas, Calif. Mr. Martin organized the findings of the committee and presented the plan to the Board of Directors of the Western Growers Assn. in February of this year. In accepting the plan, the directors voted sufficient funds to finance the building of their plant and to cover expenses incidental to its early operation.

"The problems that face the grower-shipper in pre-packaging his products are not comparable with those of distributing-center packaging—that is, the packaging of fruits and vegetables at the wholesale or retail level," says Mr. Martin. These unique problems which are peculiar to the grower are posed by the great volumes and enormous tonnage that must be packaged daily by the grower-shipper.

He says that if the grower-shipper is to average as many or more car-lot shipments per day of consumer packaged products as he does at present with bulk packing, the packaging set-up must be one which will permit him to trim, clean, dry, pre-cool and package not less than 10 tons of any one commodity an hour at a very low cost per unit.

For example, during the lettuce season in Salinas alone the average daily pack is 130 carloads. Pre-packaging of all this lettuce at the grower-shipper level on the same scale as packing in bulk will require pre-cooling capacities which will reduce a field temperature of, say, 60 deg. to about 40 deg. in approximately 20 minutes. Other operations incidental to turning out the consumer package unit must be handled with commensurate speed.

The Western Growers Institute will set up and carry through to conclusion every conceivable kind of experiment to prove conclusively:

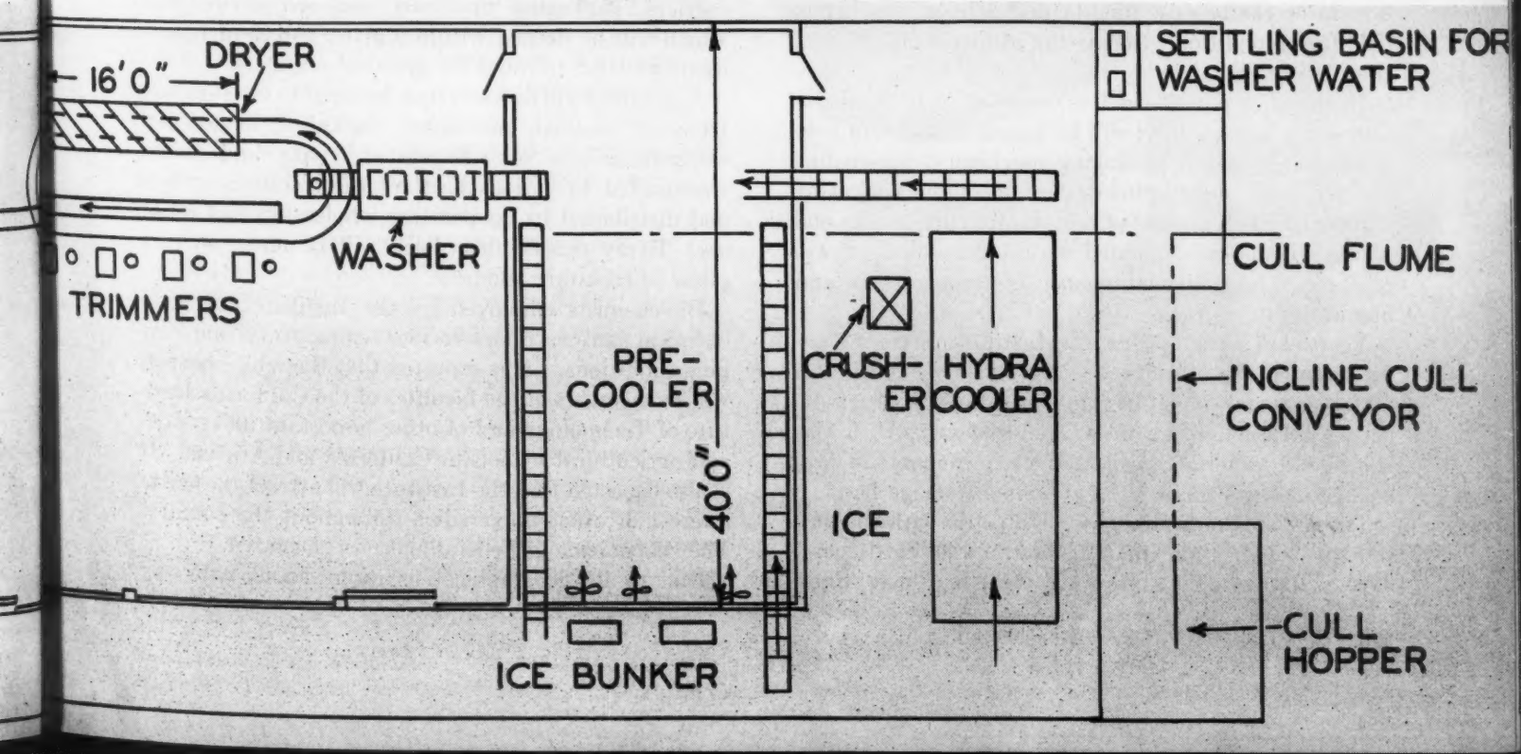
1. The type of package consumers prefer.
2. The size of package.
3. The package material which is best adapted for each commodity.
4. The type of container which is most practical.
5. The most practical methods of loading cars, trucks and airplanes.
6. The most economical and efficient methods of pre-cooling, washing, drying, trimming and other plant operations.
7. The most economical and effective method of in-transit refrigeration—rail, truck and plane.
8. The most practical and economical methods of handling consumer packaged produce by wholesalers and retailers.

The Institute and its pre-packaging program bring together for the first time in the long history of agriculture representatives of every essential component from field to table—the grower, the scientist, the engineer and the economist—to accomplish through cooperative effort what might well be termed the complete rebirth of the industry.

Needless to say, the success of pre-packaging at the grower-shipper level will put the farmer in a more strategic position. He has made great progress in applying science to his profession and in the development of soils and crops. Although he can hardly be blamed for considering his job finished when his product is delivered, the fact remains that from the point of shipment on to the consumer the fresh produce industry very largely is doing business today from the same old stand that it did in the cracker barrel days of 80 years ago.

The preparation and marketing methods of practically all other forms of food are geared to modern up-to-the-minute merchandising. The pack, the container,

(*Page 105*)



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3—*Southern California super-markets are among the leaders in conversion to self-service refrigerated display cases for the sale of packaged produce. This counter setup includes not only fruits and vegetables, in foreground, but also meats, delicatessen items and dairy products.*

the wrapper, the brand name and self-service all court the housewife. In a recent article by Mr. Martin, he says, "She even knows that her pet brand of dog food is nutritious, clean, made in a scientific factory—the dog food company has told her so on his package. But the farmer has never been able to tell her anything about himself because he has never had a package. For him to put his perishable products in a consumer package, mark his brand on it, and tell the housewife just how he works to raise quality and deliver it to her in field-fresh condition—that is the ultimate objective of the Institute."

In the pilot plant, which is expected to be in operation some time in July, will be tested all types of conveyor-belt systems, packaging machinery, pre-cooling and refrigeration equipment, containers and packaging materials. New designs of refrigerator cars, trucks and planes will be experimented with and studied, as will equipment for the maintenance of temperatures and humidities in transit.

To packaging suppliers, the Institute offers an unprecedented opportunity to test their machines and materials under actual working conditions, to learn exactly what the industry needs, and to develop their machines and materials to meet the requirements of prepackaging fresh produce on a volume tonnage basis.

The Association wants to work directly with the representatives of those manufacturers who participate. "We will provide," states Mr. Martin, "everything possible and necessary for these representatives to cooperate, advise and closely observe each experiment conducted, check results and report them (both positive and negative) to their management and research departments."

A single vegetable packaging machine capable of operating with sufficient speed to package the required tonnage per hour in a typical plant will in all probability never be developed. Hence, as in all other packaging operations, several machines—all operating from a multiple-conveyor-belt feeding system—will be necessary. Therefore, it is just as important for the package machinery manufacturer to know the true performance of his machine under various systems of feeding conveyors as it is for the material manufacturer to know for what commodities his material is best suited.

An important part of the operation will be the Retail Testing Committee. This will consist of leading retail merchandising experts in both the chain and independent fields. Every form, variation and type of package devised by the Institute will be sales tested under actual consumer marketing conditions in "guinea pig" stores designated by this committee. Various sizes and shapes of packages as well as varying weights and quantities packaged in similar types will be tested to determine consumer preferences. A "guinea pig" brand name—"Cal-Zona"—has been selected for the Institute's packaged vegetables.

The entire operation from field to consumer will be carried out on a "scale" or ratio basis. The results in terms of production capacities, various labor functions, pre-cooling, refrigeration and storage requirements, and requirements relative to cubic feet of carrier space for a given test quantity of a given commodity will be accurately computed on the basis of its percentage of the total crop volume of that commodity.

Thus it will be possible to determine not only the potential capacity for pre-packaging any one or all commodities, but to determine more or less specifically the number and types of machines and equipment, carriers, packaging materials and self-service cases which will be needed within a given length of time to distribute and to retail the growers' products.

Vegetables will be harvested, brought to the Institute, trimmed, cleaned, pre-cooled, packaged, loaded into refrigerator cars or refrigerated trucks and planes, transported to various parts of the country, received and distributed by cooperating wholesalers and retailers. Every conceivable check will be made on each phase of each operation.

Bio-chemists employed by the Institute will make chemical analyses under various temperatures and shipping conditions. It is expected that these bio-chemists will be members of the faculties of the California Institute of Technology and of other important universities and agricultural schools in California and Arizona. It is also expected that the Institute will attract the active interest of other universities throughout the country. The cooperation of Federal agencies is assured.

Due to its geographical location—about half way

between Phoenix in Arizona and the Delta region in the upper Sacramento Valley in California—Los Angeles has been selected as the location for the pilot-plant. Vegetables will start their journey through the plant just as they have been taken from the field. In order to insure their arrival at the plant in their original picked state, including stems and dirt, special insulated or refrigerated trucks with temperatures adjusted solely for the purpose of maintaining the original field condition of the vegetables will be used. Through this method it will be possible to find out just how much of the crop will "pack out."

The Cal-Co-Pak operation

Equally emphatic of the mounting significance of pre-packaging fresh produce at the point of origin is the operation of the California Cooperative Packaging Assn. Each of the nine members of Cal-Co-Pak ranks among the most progressive and successful grower-shippers of deciduous fruits, melons and vegetables in California and Arizona.

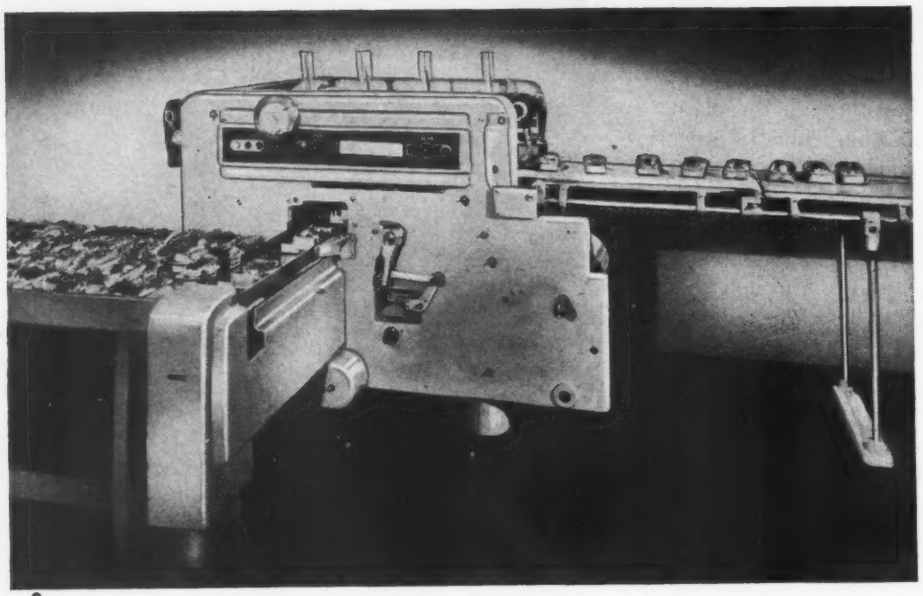
At least two members of this cooperative association have pioneered in the pre-packaging of fresh produce at the grower-shipper level and in the shipment of the packaged products by air. Ralph E. Myers, one of the associates and head of the Ralph E. Myers Co., of Salinas, opened up this field with his "Magic Carpet" brand of pre-packaged fruits, berries and vegetables now being flown to the East.[2]

During the first three-month experimental period of this operation Mr. Myers packaged and shipped 36,000 lbs. of fruits and produce. Within a short time after that he had boosted his air cargo capacity to around 60,000 lbs. a week through experimenting with various sizes and shapes of packing containers and with various types of aircraft carriers. Glenn F. Phillips, executive vice-president of Cal-Co-Pak, was associated with the Myers' operation during its formative stages, acting as Eastern liaison between the retailers, the airlines and the Salinas operations. Together, they served as co-chairmen of an Air Transport Committee set up by the United Fresh Fruit and Vegetable Assn. to explore the possibilities of air freight for perishable soil products. The so-called Phillips-Myers Report, "Air Freight for Fresh Fruits and Vegetables," brought to light unquestionable possibilities for air transport of these commodities.

Conceding that no one group or project is solely responsible for the significant reductions in air rates which have occurred to date, it cannot be denied that the collective momentum set up by organized groups and by

[2] See "Produce by Air," MODERN PACKAGING, Nov., '45, p. 96.

4, 5, 6 and 7—*Packages from the display cases of the Economart, Eagle Rock, Calif., illustrate four types of packaging now in common use. Hand-wrapped in the store, packages will be modified when adapted to machine operations by growers, but principles will remain the same.*



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8—Plans call for installation in Cal-Co-Pak plant of Package Machinery Co.'s Universal Model 4 wrapper. 9—Oliver Machinery Co.'s wrapper and labeler will be used. Both machines have been used in other produce pre-packaging operations, for which they are especially designed.

such laboratories as the Myers and the A & P operations, coupled with the active cooperation of the airlines, has helped to produce rates which are more and more commensurate with the intrinsic value of the commodities carried. The published air express rate of 76 cents per ton-mile which prevailed prior to these operations has dropped to a present low of 15 cents per ton-mile, published by United Air Lines. Authorities in all phases of the industry agree that a basic rate of 5 to 10 cents per ton-mile is not beyond the realm of possibility.

The refrigerated truck, combined with the inevitable network of new four-lane transcontinental express highways, offers another possibility. Already fleet operators are guaranteeing to get produce to Ohio from California in five days and from Arizona in six days. Express highways and continuous refrigeration can and will put garden-fresh produce, pre-packaged on the Pacific Coast, in Chicago in four days and in New York in five days.

Even the railroad industry, the "old man of the mountains" in the long-haul field, is rousing from more than a half century of static "reefer" service basically unchanged since the advent of the refrigerator car 70 years ago.

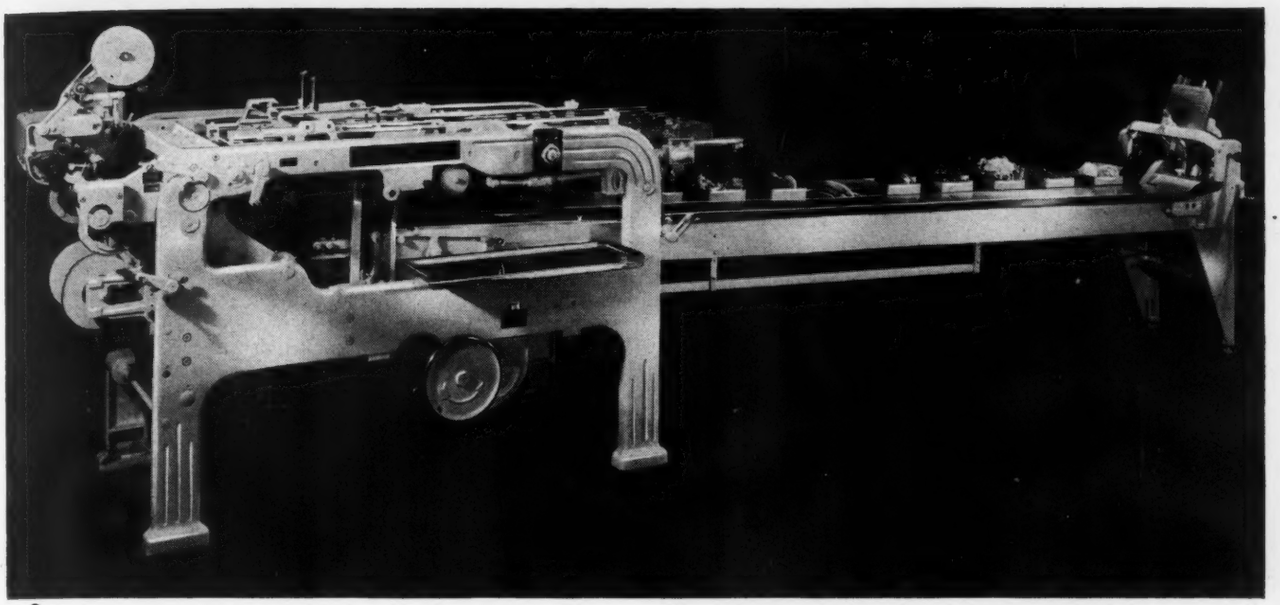
The success of pre-packaging fresh produce at the point of origin—dictating as it does continuous refrigeration, controlled in respect to temperatures and humidities, as well as rapid transit—precludes the old-fashioned reefer, undependable icing methods, costly yard delays and schedules which bring perishable products into Eastern markets from 10 to 15 days after they have been loaded.

Formidable answers to the challenge of both truck and air express are currently being developed by the railroads in the form of new types of refrigerator cars and tentative faster than mile-a-minute schedules. One of these experimental cars now being constructed by the Illinois Central at McComb, Miss., was jointly designed by railroad engineers and the Refrigerator Car Committee of the United Fresh Fruit and Vegetable Assn. Built largely of aluminum with Fiberglas insulation, the car also features "baby-buggy" springs, built-in stabilizers in the bolsters, and a cushion type of underframe for easy riding qualities and to prevent damage from train shocks. Temperatures will be maintained by forced air circulation over ice.

Two experimental cars of similar basic design have also been built by the Burlington with the cooperation of growers, shippers and others. One of these cars features circulation of air over ice while the other is designed for circulation by natural convection. Loads may be cooled by air circulation from ice bunkers or by direct icing if desired. Both are equipped with electric lights for night loading and inspection and with outside thermometers registering floor and ceiling temperatures. In view of the tremendous carrying capacities, this type of rolling stock combined with tailored schedules will do much to help the railroads retain their supremacy in the transportation of fresh produce.

In coming together to form Cal-Co-Pak, the nine members of the Association are perhaps setting the most logical basic pattern for successful pre-packaging at the grower-shipper level. Collectively these men produce and ship practically the entire range of deciduous fruits, melons and vegetables. On a cooperative basis they are equipped for year-round operation. As individual operators, however, each would be limited to seasonal operation, due to the fact that he actually specializes in but a few commodities.

The value of the cooperative in this respect is further emphasized by the extensive scale upon which each of the members operates. For example, one of the group is known as the nation's biggest producer of lettuce. Others are big individual producers of broccoli, cauliflower, cabbage, beans, peas and other commodities, as well as melons and various varieties of fruits. Smaller operators would have even a greater need for a cooperative method of pooling their products for pre-packaging.



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It is true that a big operator could pre-package and ship on a year-round basis by buying from fellow growers those commodities which he does not produce. In that case, however, he would become a dealer rather than a grower.

Los Angeles has been selected as the location for the Cal-Co-Pak plant and that area will serve as the proving ground for the pre-packaged items. When the plant goes into operation some time this summer, it is expected to pre-package in consumer units approximately 60,000 lbs. of fresh fruit and vegetables per day. The proposed layout for this operation is shown in Fig. 2.

Produce products will be transported to the plant in refrigerated trucks, where they will be placed in a hydra-cooler. From there they will move to the pre-cooler. After temperatures have been reduced to pre-determined requirements they will travel by one conveyor to a circular conveyor especially designed for a sequence of operations—washing, trimming and drying. Another conveyor will carry the products to the packers and on to the packaging machines, where they will be automatically wrapped, sealed and cased, then placed on a final conveyor which will carry the cases to refrigerated storage.

At the start of the operation, three packaging machines of standard make which are considered sufficiently adaptable to handle the full range of more or less standardized packages will be used.

One of these machines can be adjusted, while in operation, to eight sizes of packages. These may range in length from $3^3/_4$ in. to $14^3/_4$ in., in width from $2^3/_4$ in. to $8^1/_2$ in. and in height from 1 in. to $5^1/_4$ in. It is also equipped with an automatic paperboard folder and feeder and a device which heat seals a label onto the wrapper imprinted with the price, weight and date of wrapping. The positioning of the wrapper is electric-eye controlled. The specific lengths of cellophane or other transparent wrapping materials can be adjusted to the various sizes of packages while the machine is in operation.

Two other machines are also high-speed models, capable of turning out from 25 to 55 packages per minute and 13 to 55 per minute, respectively. Both will handle packages ranging in length from 6 in. to 18 in., in width from $2^1/_2$ in. to $7^1/_2$ in. and in height from $1^1/_2$ in. to 6 in. The package itself measures the length of cut-off of the wrapping material; therefore no adjustments are required to change the cut-off for varying lengths of packages. A cellophane or wrapping spindle with compensating flanges insures simplicity in changing the width of the roll where there is a difference in the length or thickness of packages. One of these machines is equipped with a top-label unit from which labels are fed from a roll and sealed to the top of the package.

Broadly speaking the Cal-Co-Pak group will employ the various types of packages for fresh produce which have so far proved most successful in the Myers, the A & P and the other pre-packaging operations. Each package will be pre-labeled with the weight, quantity and price. Although various packages for various commodities will differ in size, shape and perhaps principle, according to the specific requirements of the products, the principle of maximum visibility will be applied in every case.

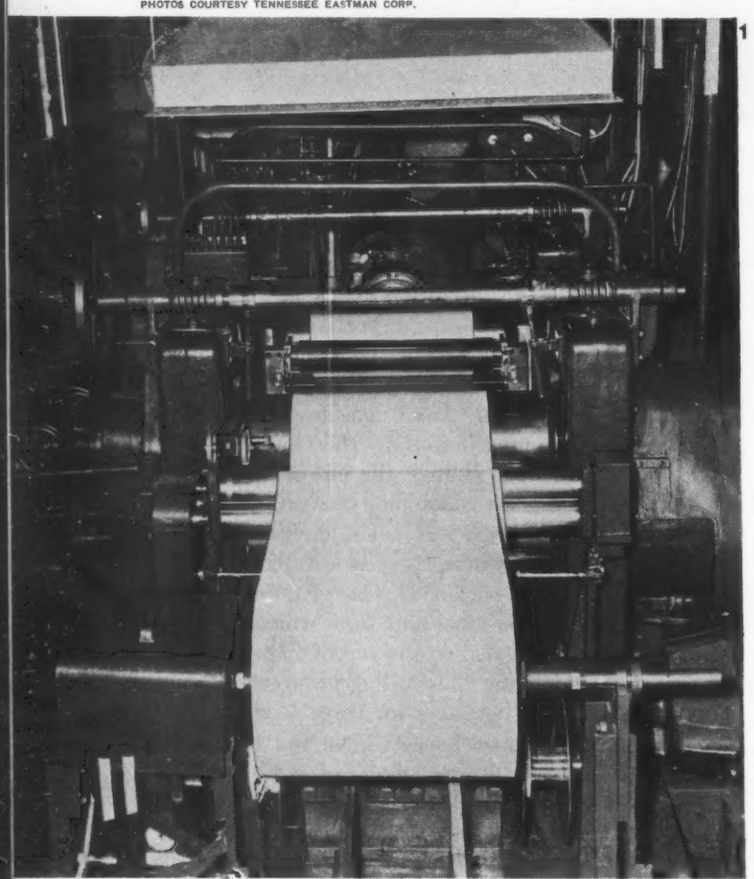
Many items will be packaged in paperboard u-boards or shallow four-sided trays, and overwrapped with moistureproof cellophane or other transparent film material and heat sealed. Such commodities as carrots, spinach, string beans, lima beans and peas will probably be packaged in sealed transparent bags. Commodities such as fruit and tomatoes may be packaged in cartons, either square or oblong in shape, with transparent windows extending from midway on the front of the package to midway over the top for easy visibility of the colorful contents.

Even though this is a com- (*Continued on page 170*)

Low-cost plastic sheet . . . by extrusion

A new low-cost method developed by the Tennessee Eastman Corp. for producing semi-rigid plastic sheet by extrusion is expected to bring thermoplastic containers fabricated from such sheet to many products which in the past have not been able to afford their use. Envisioned are transparent plastic containers for inexpensive costume jewelry, colorful opaque plastic hat boxes, and plastic packages for a number of other items that usually sell in the very low price groups.

PHOTOS COURTESY TENNESSEE EASTMAN CORP.



1

Cost of fabricated sheet plastic containers may be reduced 40% by the new process. This saving would apply to the package fabricator and be carried through to the package user.

There is an additional saving to an extruder who forms the sheeting himself. The lace and trim scrap can be granulated and fed again into the hopper of the extrusion machine, thereby effecting up to 100% utility of the material, provided it is kept clean.

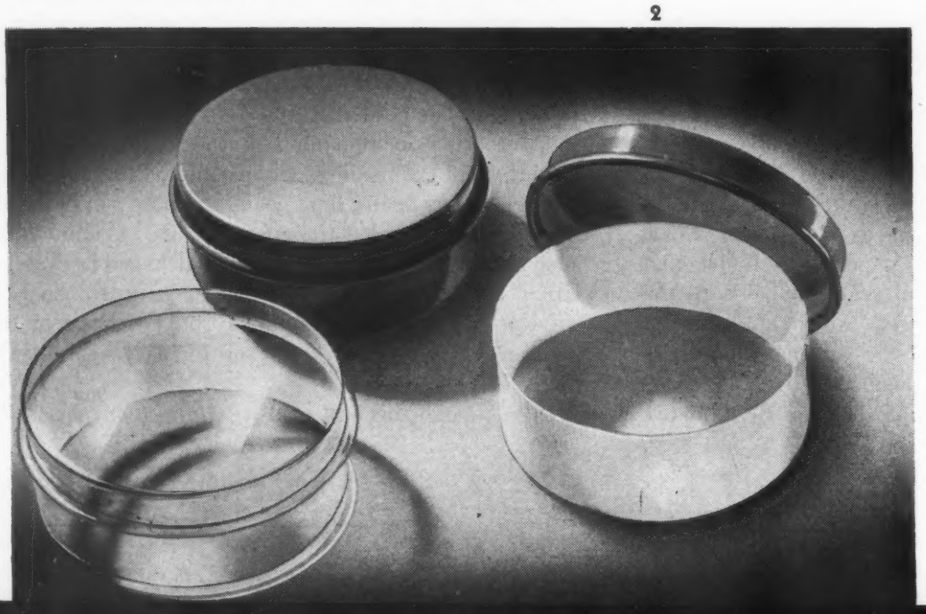
This method has been developed primarily for Tenite, the Tennessee Eastman cellulose acetate and cellulose acetate butyrate plastics which are already well known for their extrusion and molding properties.

The principle of the new method is continuous extrusion under heat and pressure, without the use of solvents. The process forms a continuous sheet of any length in one straight-line operation. The material is extruded from a circular die operating in conjunction with a conventional plastics extrusion machine. The sheeting is drawn from the die as a tube, slit at the bottom as it comes from the die and subsequently made flat in one uninterrupted operation.

At the present time the sheets are being made in thicknesses of from 0.010 in. to 0.040 in. and in widths up to 24 in. From 100 to 130 lbs. of sheet per hour can be produced by an extruder having a $3^1/_4$-in.-diameter cylinder. Thicknesses most widely used by the packaging industry range downward from 0.010 in., the current minimum by this process, to 0.0075 in. The extrusion machine has not yet been able to produce commercially sheet slighter than 0.010 in., but new techniques—such as housing the equipment to retain heat—are being considered which are expected to enable the production of 0.005 in. sheets. Getting the material down to film thickness is not envisioned at the present time.

Both transparent and opaque sheeting can be made by the dry-extrusion method. The opaque sheets can be produced in any color and small quantities of different colors may be manufactured economically.

2



1—Overall view of extrusion and rolling equipment for continuous sheeting of thermoplastics. Extrusion head is in background.

2—Containers drawn from acetate sheet produced on extrusion machine. Material draws readily. Low-cost production of sheet should provide such containers for many products.

The material lends itself readily to use on the new fully automatic machines for drawing containers at high rates of speed. These machines, which are now being made by several manufacturers, operate at low cost. The combination of low-cost plastic sheets and low-cost drawing operations will place transparent plastic containers within the reach of many additional products.

For many years thermoplastic sheeting has been produced by methods which, due to their complexity, have caused the price of sheeting to be high in comparison with the price of the raw material from which it is made.

The present cost of acetate sheeting to the fabricators of containers ranges from 90¢ to $1.10 per pound. The acetate granules from which the sheeting is made cost only 40¢ a pound. The new simplified process may reduce the production costs of the sheeting operation to 20¢ a pound, which would enable the producer to manufacture the finished sheeting at a cost something like 60 cents a pound—from 30 cents to 50 cents less than the present selling price.

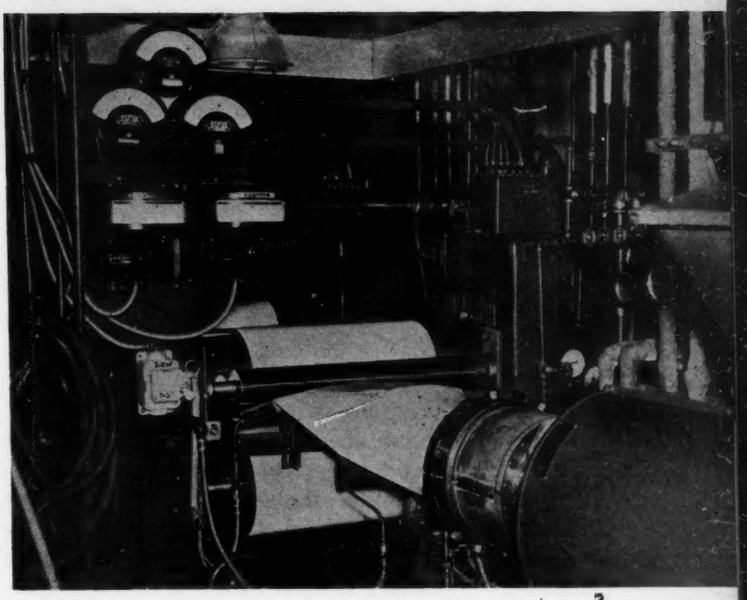
In the most commonly used method for making sheet, the flake material is first mixed with a solvent and then cast in cake form. Pressure and heat are required in the production of this cake. When the material is completely set, it is reduced to sheets of the required thickness by a planer. The sheets must then be seasoned for a matter of days to afford time for the evaporation of residual solvent. Then, to remove the longitudinal lines left on the surface of the material as a result of the sheeting operation, each sheet of material is placed between highly polished plates which are, in turn, placed in a hydraulic press. A heat-and-chill cycle under pressure molds the surface of the sheets to conform exactly to that of the polished plate and thereby removes the unsightly "sheeter lines."

The unit used for the new non-solvent or so-called dry extrusion method consists of four components—extruder, circular die, spreader bars, and pull-out and tension rolls.

Production of sheet starts with the extruder, equipped with a $9\frac{1}{2}$ in. diameter annular die, which extrudes the material in the form of a tube. The tube is slit or cut just as it issues from the die by a wedge fastened to the outside of the die at the bottom.

About $\frac{1}{2}$ in. from the face of the die, a uniform stream of hot air is directed on the slit tube from both inside and outside. The hot air acts to set the plastic sheet just enough to make it self supporting, so that it can be controlled in subsequent operations. At the same time, the air maintains the sheet in sufficiently flexible condition so that it will not become too hard to flatten.

The sheet is then carried over a series of forming or spreader bars which work it from a tubular to a flat shape. The spreader bars are water-cooled to prevent sticking of the hot sheet. From the final spreader bar, the sheet passes under a heated roll for final flatness and then around a pair of pull-out and tension rolls which maintain tension and wind the finished sheet into rolls.



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3—View of machine from intake end. Granular plastic is fed into hopper at right, extruded through circular die, slit, then spread and flattened by a series of rollers.

The material may be shipped to the fabricator either in rolls or in sheets, depending upon the use to which it is to be put.

The extruder is a standard machine equipped with a variable speed drive. The jacket around the cylinder is divided into three sections: a water-cooled chamber around the feed throat, an intermediate heating zone, and a high temperature zone at the discharge end, the latter two sections being heated by circulating hot oil. Two oil circulation systems are maintained to effect the different temperatures. A single system can be used by restricting the flow of oil through the section where the lower temperature is required. The screw itself is not positively heated or cooled, but becomes hot by conduction from the plastic which is heated by the cylinder and from the heat of friction created by the mechanical mixing of the plastic.

As the plastic leaves the cylinder, it is forced through a wire screen to remove any large foreign particles and to improve homogeneity. After passing this screen, the plastic material enters the extrusion die which forms the material.

This continuous process shortens materially the production time. The several days required for drying and seasoning under the old process are no longer necessary, since the material is ready for use as soon as it comes off the production line and is cooled.

Two companies are known to be making sheeting by the process of dry extrusion. The unique feature of the Tennessee Eastman process is the extrusion of sheet as a slit tube with subsequent forming to a flat sheet. It is believed to give better control of uniformity of thickness.

Another interesting point is that dry extruded sheets are not quite as rigid in the same gauge as plastic sheets

made by the solvent process. It is for this reason that the dry extruded sheets are superior for drawing operations.

While this plastic sheeting is extremely advantageous from the cost standpoint, it does have some limitations. The finished sheet contains more surface imperfections than sheet cut from blocks. Naturally, the imperfections are not as obvious on the opaque sheets as they are on the transparent ones. Despite the surface flaws, however, it is claimed that the opaque sheeting is usable for 80% of all packaging applications generally and that the transparent is usable for 40% of all transparent applications.

Experiments have been conducted on roll polishing the sheet to eliminate the flaws, although this development work has not yet been completed. The machine employed, which polishes the material in a continuous operation, consists principally of a large drum with five smaller rolls evenly spaced about the lower half of its periphery. The sheet, after it passes the water-cooled spreader bar, is fed down between the first small roll and the large rotating polishing drum. The sheet, which adheres to the drum, travels with it and is carried through the series of small rolls. Heat of the second and third rolls polishes the sheet, and the last two rolls are cooled to harden the sheet enough so it can be removed from the drum without sticking or stretching. Following stripping of the material from the drum, it is conducted through a pair of rubber rolls to keep it stripping from the drum without chattering and also to prevent distortion. From the rubber rolls, the sheet may either be wound into rolls or conducted along a belt conveyor to a cutting table where it may be cut to required size.

The low cost of the extrusion machinery points to the possibility of more decentralized production of plastic sheeting. The equipment and machinery required for the methods now commonly used are intricate and expensive. The new process is simple and the necessary machinery probably could be built at a cost of about $20,000.

Many local manufacturers will be able to set up the new equipment and produce sheet close to the points of sale. With this low-cost equipment it seems possible that every large city in the United States will eventually have facilities for the production of plastic sheet. Local manufacture of the sheet will eliminate transportation expense and thus further reduce the cost of transparent containers to a level where they may become popular packages for items selling in five-and-ten-cent stores. It may even be practicable for package fabricators, when the process has been perfected to make thinner sheet, to expand their operations to the production of sheet plastic from which they will make their own containers.

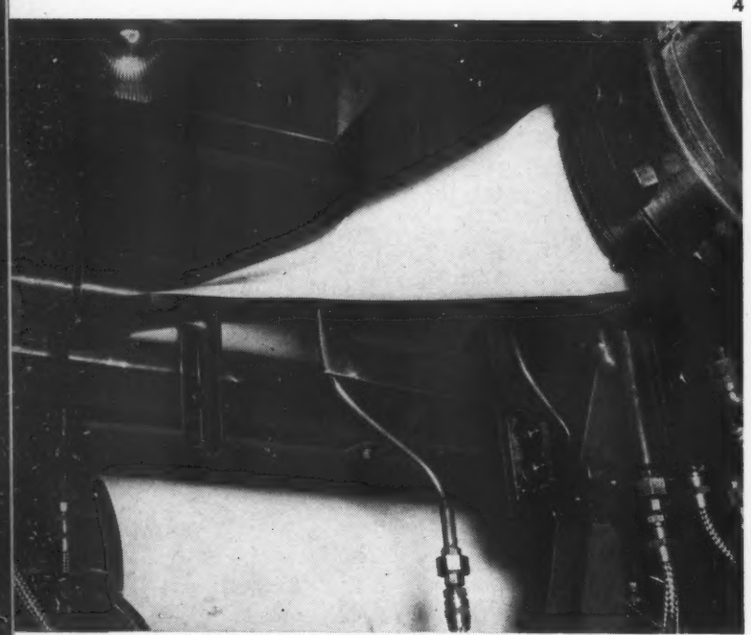
Tennessee Eastman Corp. does not intend using this equipment for the production and sale of sheet materials. The development work has been done as a service to industry, and complete plans and details of the new process* will be made available by the company to those interested.

Several equipment manufacturers are preparing to produce the complete processing unit and at least one company expects to quote prices soon on the four components—extruder, circular die, spreader bars, and pull-off and tensions rolls—as a complete unit.

* A complete diagram of the equipment and additional technical detail appeared in Modern Plastics for May.

4—Close-up of critical operation in which extruded tube is slit and transformed by spreader bars into flat sheet before passing into flattening rollers. Jets of hot air help to support the material and to set the plastic. **5**—*Close-up of the two brass spreader bars, looking toward extrusion head, indicating how slit tube is gradually spread to a flat plane. The spreader bars are water cooled to prevent sticking.*

4



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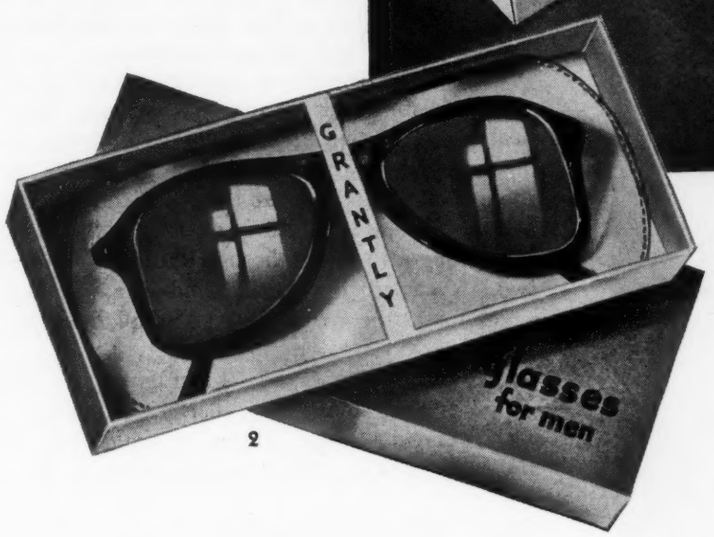
1—*Two-piece folding boxes are used for the new Grantly line of sunglasses styled one for women, one for men and "Town and Country" for both sexes. Each is distinguished by different box coloring and product-name lettering.*



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2—*Glasses are held in place by die-cut notches in base and paper tape on top. Transparent pocket case is also included.*

3—*Counter merchandiser for women's line. Holds four packages in front, with storage compartment in back. Customer takes glasses from merchandisers for each of the lines completely boxed.*

Sunglasses . . . boxed for sex appeal

Popular-priced sunglasses have usually been presented as "carded" merchandise. The Foster Grant Co., Leominster, Mass., is putting its three new lines in well-designed, two-piece folding boxes, as a part of a revolutionary merchandising program in which fashion appeal is an important feature.

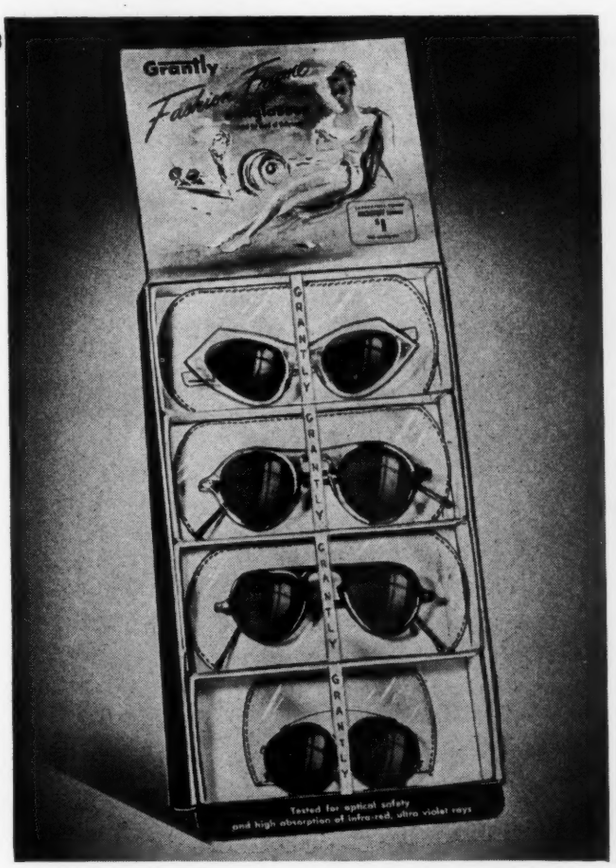
In this program sunglasses have sex. There is one line of glasses for men called "Eye Style," one for women called "Fashion Frame." A third group of "utility" styles for both sexes is labeled "Town and Country."

The theory is that people buy sunglasses primarily for eye protection, but that today they choose between one brand and another because of how the frame styles and color look on the wearer.

The purpose of the boxes is to create a setting for the glasses appropriate for the high fashion of these products. Also included in the box with each pair of glasses is a transluscent plastic pocket case. The boxes protect the merchandise, since frames are not bent as when they are pulled off cards, it is said. The packaging is also designed for flexibility in display because of paperboard counter units supplied with the orders at no extra charge to the dealer.

All the shopper has to do is select from the counter unit the type of glasses he wants, lift them out completely boxed ready to take home. The counter merchandiser is equipped with storage compartment, so that the dealer merely replaces (*Continued on page 174*)

3



Handy dispenser

Pressure-sensitive labels are a handy household product if packaged so that they are easy for the consumer to handle. Dennison Mfg. Co., has solved this problem with an ingenious new dispenser box for its postwar line of Pres-a-ply labels. The user simply pulls slowly the glassine backing tape shown in the top picture (left) and out flips a label onto a metal writing plate ready to be marked with pen or pencil.

The box is two-piece, folding-carton construction, one part fitting over the other as a sleeve. The labels, backed by glassine tape, are rolled and placed in the inner section of the box. The tape is then threaded through the metal plate on the top of the outside sleeve. When the tape is pulled it automatically releases the labels, one at a time, through the slot formed by the two box parts fitting together and over the metal plate, which forces the gummed side of the labels away from the tape.

The labels, packaged in this manner, are offered in several shapes and sizes either round or rectangular with rounded corners. Color for the design is orange and black with directions for dispensing on the top.

CREDIT: *Carton, Sample-Durick Co., Inc., Indian Orchard, Mass.*

DESIGN

Pictures on Uneeda

A significant package change is the new wrapper for Uneeda Biscuits. For the first time a full-color reproduction of the cracker appears on each panel, yet the package retains its trail-blazing identity. Even on a package as well known as this, Nabisco felt the customer should know exactly what she is buying.

Uneeda Biscuit was the first packaged bakery product sold nationally and associated with the passing of the cracker barrel. Its advent in 1899 marked one of the early departures from selling merchandise in bulk.

The motif for the original Uneeda Biscuit wrapper was taken from the Morocco binding of a 16th century Grolier volume. This border has been retained in the new design with the same purple background selected almost 50 years ago. Also retained is the famous Nabisco trademark—a medieval Venetian printer's mark—a circle with a cross, supposedly signifying the spiritual world over the terrestial. This was adapted to "In-er-Seal," the selling feature of this new sanitary package—pulp board treated to resist moisture, folded around a paraffin lining—the basic principle of Nabisco's Uneeda carton wraps today.

(*Page 114*)

Betty Crocker's flat-iron

General Mills goes into a new packaging program with the introduction of its home appliances. First to appear is the prepack for the General Mills electric iron, which sets the pattern for this new family of packages. Basic design, which will be applied to cartons, tags, labels, instruction booklets, consists of white polka dots on a red background. In some instances the design incorporates the familiar Betty Crocker picture.

The basic design has been created to provide a simple visual theme which will quickly identify General Mills home appliance cartons, displays, advertisments and other promotional material.

Application of a striking eye-appeal design with plenty of memory value for prepacks in the home appliance field is one that has only begun to be given the importance it deserves. General Mills believes it offers maximum promotional opportunity to associate company name with product among consumers, retailers and wholesalers. They feel that all will soon come to recognize the white polka dot on red as distinguishing General Mills home appliances.

CREDIT: *Cartons, Waldorf Paper Products Co., St. Paul, Minn.*

HISTORIES

Dressed-up salt

New 4- and 10-lb. Deltaseal paper bags for Sterling salt, said to hold their shape and stand upright as a carton, lend new merchandising appeal to a product that formerly was stacked on the bottom shelf of the grocery store.

These new bags, adopted by International Salt Co. also have a convenient pouring spout as shown in the photo (right) so that the salt may be transferred to household salt containers without spilling.

Market tests in selected stores indicated that the new paper bag—unlike its predecessor shown at left in photo—encourages grocers to take bagged salt off the bottom shelf and stack it for shelf display at eye level and to use the bags for floor displays in heavy traffic locations.

The new bags, printed in red and blue, carry Sterling's familiar trade character, the running sailor known as Salty, on the display panel. A set of directions is printed on the back to give housewives hints about the proper use of salt in food preparation, cooking, canning and pickling.

CREDITS: *Design, Jim Nash, New York. Bag, Bemis Bro. Bag Co., St. Louis, Mo.*

(*Page 115*)

The chips don't chip

. . . a new, high-speed, accurate weigher permits packaging of potato chips and similar products with minimum breakage

Potato chips are one of the most difficult products to weigh and package accurately at high speeds. They are non-free flowing, fragile and unusually bulky for their weight.

Special import attaches, therefore, to the installation by Gordon Foods, Atlanta, Ga., one of the South's largest manufacturers of potato chips, of a new automatic weigher that is said to surpass in speed, accuracy and general handling any other method or machine now in commercial use.

The machine employs a new method of weighing based upon the principles of hydro-electric positive displacement. This particular model was designed specifically for potato chips, but it will also handle popcorn, julienne potatoes and like products. Departing from the conventional beam or spring scales, the machine weighs and discharges the product at pre-determined net weights of from $^{3}/_{4}$ oz. to 2 oz. Other models handle a wide variety of products at weights ranging from $^{1}/_{8}$ oz. to 1 lb.

First public showing of the new method of weighing was made at the Packaging Exposition in Atlantic City last month. The first commercial installation was at the Atlanta plant of Gordon Foods earlier this year.

After two months of operation under actual plant conditions, the weigher has demonstrated to their satis-

1—This interesting machine, incorporating a new principle of weighing, will fill 23 bags of potato chips per min. at a tolerance of $^{1}/_{16}$-oz. and with virtually no breakage. It is shown in operation at Gordon Foods, Atlanta.
2—Gordon packages are printed flat bags of waxed glassine, folded and stapled shut. The $^{3}/_{4}$-oz., 5¢ package is the biggest seller.

faction, Gordon Foods officials say, that the previously tough problem of weighing and packaging potato chips has been licked. Plans are being made to have the firm's other plants at Louisville, Memphis and Birmingham completely equipped with the new weighers as soon as deliveries can be made.

Production records

Production records show that the new machine, which is operated by one girl, weighs an average of 23 bags of 3/4 oz. of chips per minute. The average of other operators in the plant using a conveyor, elevator-type, semi-automatic feed and hand-weighing method is 10 bags per minute.

Along with speed, the machine also permits accuracy of a higher degree than heretofore possible. Check weighing revealed that the weight of 3/4 oz. packages is held to a tolerance of 1/16 oz. This is a 50% closer tolerance than has previously been achieved.

Breakage has been reduced sharply, also. Just how much is difficult to determine, since there is some breakage before the chips are conveyed into the weigher. An indication of the more gentle handling is evidenced, however, by the fact that only five dozen 5¢ packages of chips weighed by the new machine will fit into the company's regular corrugated shipping container, whereas six dozen bags weighed by the old method will go into the same container. Thus it appears safe to say that breakage during the process of weighing has been radically reduced.

The machine (Fig. 1), identified as the Hy-Tra-Lec Model A Automatic Weigher, consists of the weigher and a vibratory feed mounted on a separate stand. The entire unit is compactly designed with a minimum of parts and operates smoothly and quietly. It measures about 5 ft. 7 in. in height and about 4 ft. 9 in. in width.

At Gordon Foods and in other plants where the machine will be installed, the weighing operation will follow the operation of what is now known in the trade as the "potato chip machine," which peels, washes, slices, destarches, fries and salts the chips. The exact manner of getting the chips from the master machine to the weigher's vibratory feed probably will vary with plant methods. At Gordon Foods the chips move on an elevator-type conveyor belt which runs above a long weighing and packaging table. A chute opens onto the conveyor belt and through it the chips pass to the vibratory feed. (Fig. 6).

Provided chips are delivered evenly to the vibratory feed they are fed to the weigher in a continuous stream. Two buckets are mounted in the machine. While one bucket resting on the weighing device is receiving the material, the other bucket is discharging its contents into a chute. When the proper amount of material has entered the bucket resting on the weighing device, a cut-off plate stops the flow of material until the second bucket is in place. This helps to assure a high degree of accuracy by reducing the amount of material in suspension at the instant the proper weight has been reached. The weighing device itself is sealed and is not visible.

The operator places a bag under the discharge chute to receive the weighed material. To the left of the chute is a storage compartment for bags. The door of the compartment opens to form a platform for holding a supply of bags for use by the operator. There is also a compartment where the girl operator may keep her purse—a much-appreciated feature.

Functions of the weigher do not include closing the bag. At Gordon Foods this is done by a girl seated next to the operator of the weigher. The bags are folded by hand and closed by inserting them on a stapling device. The stapled bags are tossed on a conveying belt which carries them to the end of a long table, where they are placed in shipping containers.

Progressive improvements

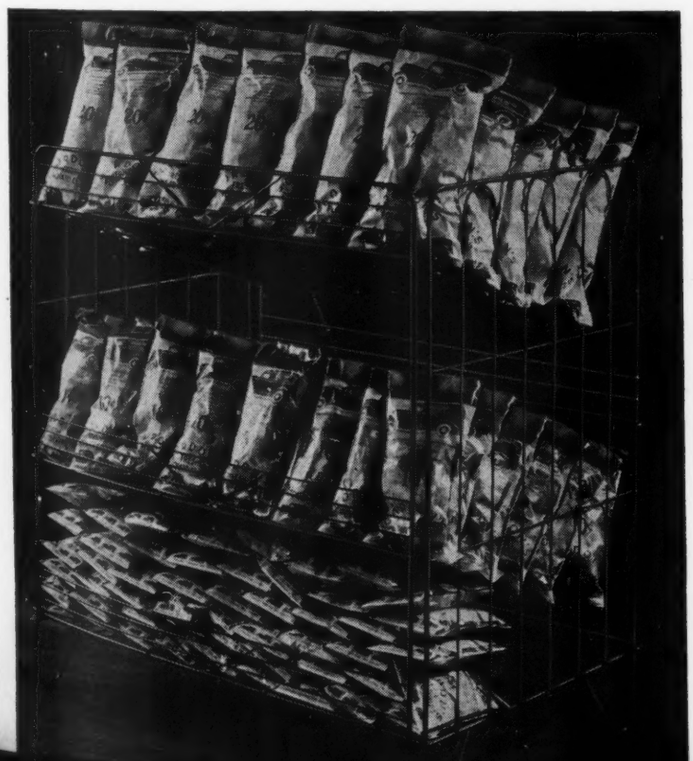
Remarkable progress in the packaging of potato chips has been made in recent years. Page 118 shows the three major steps of progess at Gordon Foods.

The strictly hand method is shown in Fig. 4. Chips are discharged from the potato-chip machine into boxes. The boxes are then picked up and dumped on a weighing table. Attendants scoop the chips into bags which, when filled, are placed on a scale for weighing. By this method, speed was six bags per minute, accuracy was only fair and breakage was considerable.

The semi-automatic feed and hand-weighing method is shown in Fig. 5. Chips are carried from the potato-chip machine to an overhead conveyor. The attendant pulls chips into a chute by the use of a rake-like device, propels chips by hand from the mouth of the chute into a scoop, then places the scoop on a scale and weighs by hand, filling the bag with chips from the scoop. Speed reached 10 bags per minute by this method, and accuracy and breakage remained about the same.

The new method of weighing is that illustrated (Fig.

3—*Wire display rack is provided retailers to show off the plump, attractive package to its best advantage.*



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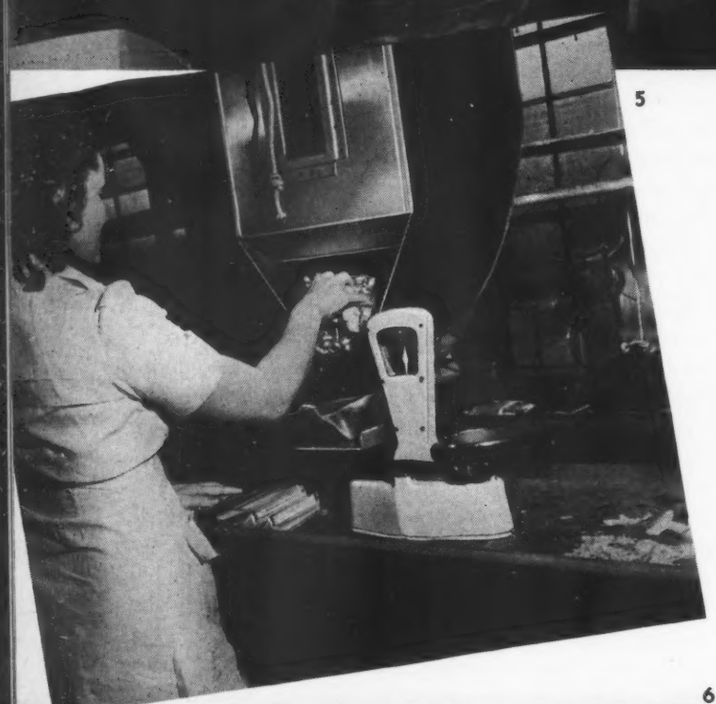

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4—Original hand weighing, bagging of potato chips. Speed: 6 bags per min. **5**—*Semi-automatic feed, hand-weighing was improvement. Speed: 10 bags per min.* **6**—*Overhead view of new automatic machine; fills 23 bags per min. with one operator. Note chips pouring from elevator-type conveyor belt to vibratory trough which "dribbles" them into hopper of the weigh-filler. Exact weight of chips is automatically delivered to bag.*

6) and discussed above. Here, it will be noted, speed is 23 bags per min.; weighing tolerance is $^1/_{16}$ of an oz., and there is practically no breakage.

Other variations of the Hy-Tra-Lec Weigher are the Automatic Model B and the Semi-Automatic Model S. The Model S (Fig. 7) is for weighing at pre-determined weights a variety of products in charges ranging in weights of $^1/_8$ of an ounce to 1 lb. It is built primarily for the use of blind operators. It is equipped with two buzzers, set at different frequencies to sound different in tone. One sound indicates the *approach* to exact weight and the other indicates exact weight reached.

The Model B (Fig. 8) handles both free-flowing and non-free-flowing materials at pre-determined net weights ranging from 1 oz. to 1 lb. This model is for packaging such items as candy, coffee, cereals, sugar, nuts, pills, dried fruit, noodles, cranberries, spices, coconut, rice, cut macaroni, peas, beans, etc.

Survey of packaging practices

The National Potato Chip Institute recently conducted a bag survey through a questionnaire mailed to its 197 members. Following is a tabulation of results compiled from the 117 replies received:

Which style bag is preferred?	
Square or tuck	49%
Flat	48%
Satchel bottom	3%
What type bags are now used?	
Waxed glassine (2 sides)	90%
Waxed glassine (1 side)	4%
Plain glassine	6%
Duplex Cellophane	12%
Single cellophane	4%
Foil	3%
Do you have bag-testing equipment?	
Yes	3%
Would you be interested in bag-testing equipment?	
Yes	87%
Do you make your own bags?	
Yes	6%

(*Page 118*)

Are you going to change print style of your bags?	
Yes	49%
How many colors do you prefer?	
Three colors	76%
Two colors	22%
One color	1%
Do you print recipes on your bags?	
No	78%
Yes	19%
What "price" bags do you pack?	
10¢ size	95%
5¢ size	80%
25¢ size	60%
15¢ size	41%
20¢ size	24%
30¢ size	17%
60¢ size	14%
35¢ size	11%
55¢ size	3½%
45¢ size	2¼%
40¢ size	1 7/10%

Gordon Foods packages its potato chips in three different sizes of printed flat bags of waxed glassine (Fig. 2). Pictured here (Fig. 3) is a new display selling rack which the company is now locating in grocery stores and super markets. The 5¢ package contains ¾ oz. of chips and measures 5 in. by 9 in. The 10¢ package, containing 2 oz. of chips, measures 5½ in. by 14 in. The 20¢ package contains 4½ oz. of chips and measures 7 in. by 16½ in.

The company's Atlanta plant usually turns out about twice as many 10¢ packages as 20¢ packages, and approximately twice as many 5¢ packages as 10¢. The ratio of package sales to package sizes, however, varies with the season, more of the larger-sized packages being sold in the summer than in winter months. Since the organization of Gordon Foods in 1938, its sales of potato chips, peanut butter sandwiches, 5¢ cakes, nuts and candy have continually increased to reach a volume of approximately $4,500,000 in 1945.

That the first commercial installation of the new high-speed method of weighing has been made in a potato-chip plant is indicative of the industry's desire for and alert interest in improved packaging. The response to the Institute's survey shows the industry is aware of the importance of good packaging and anxious to improve its present packaging practices.

The potato-chip industry has grown tremendously in the last 10 years. According to figures of the Institute, the industry in 1945 employed approximately 13,000 people and used 649,535 lbs. of potatoes. An aggressive program of publicity is now being conducted by the National Potato Chip Institute.

CREDITS: *Hy-Tra-Lec weighers, designed and manufactured by Wright's Automatic Machinery Co., Durham, N. C. Vibratory feed control by the Syntron Co., Homer City, Pa.*

***7**—The Model S weigher is also used to package potato chips. This machine is intended especially for blind operators. As the chips raked onto the scale reach desired weight, a buzzer sounds; the hopper is then dumped into the bag.* **8**—*Model B weigher, similar to Fig. 1 with vibratory feed but with two discharge spouts, will handle free-flowing and non-free-flowing materials at pre-determined net weights from one ounce to one pound.*

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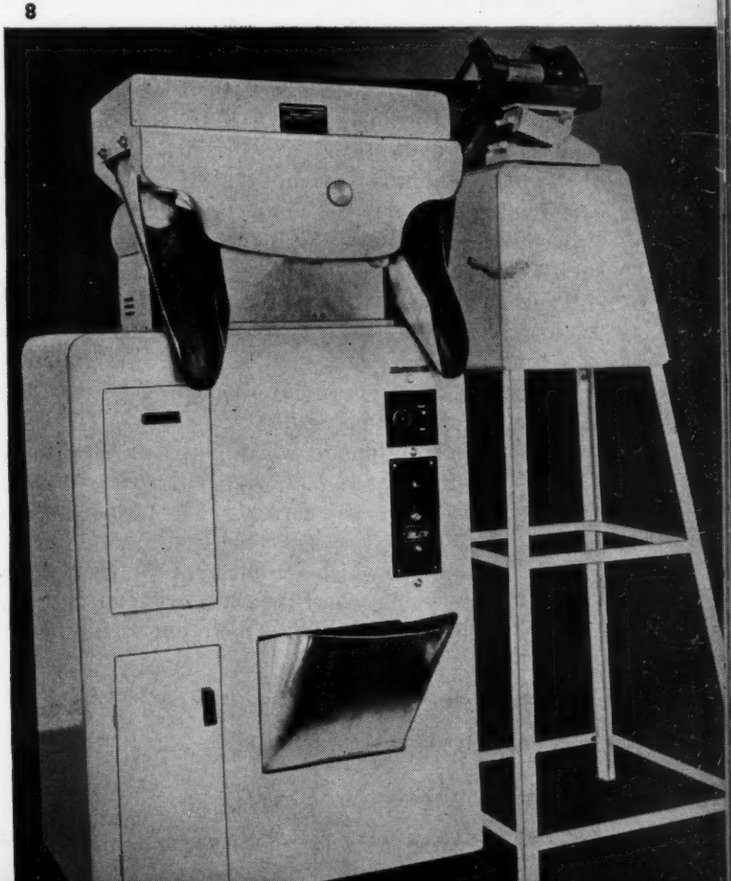
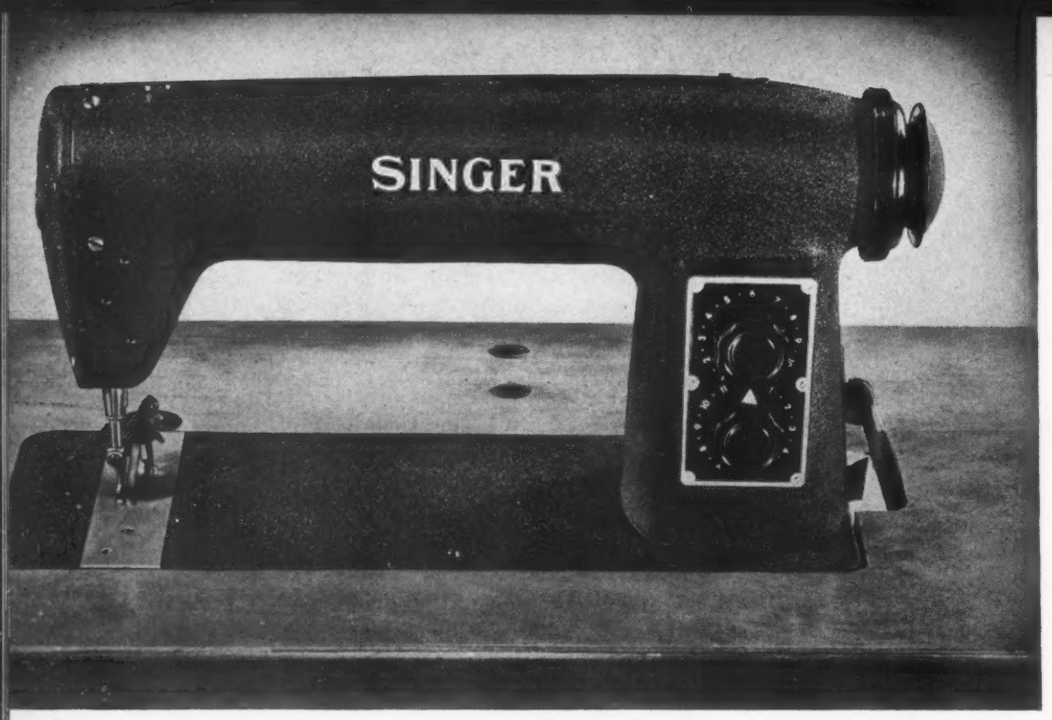




1—Close-up of sealing head of new Singer heat-sealer. Head housing is adapted from one on conventional sewing machine—but works are far different. High-frequency current passes between electrodes which replace the stitching mechanism.

A new electronic heat-sealer

Ever since Radio Corp. of America announced its electronic "sewing machine" in 1943* there has been great interest in the packaging field in this rapid, positive means of heat sealing thermoplastic materials. But war priorities halted the further development and sale of this type of equipment and only a few units were allotted to top-priority war packaging jobs.

Now the Singer Sewing Machine Co. has announced the independent development of a somewhat similar sealer which, as rapidly as manufacturing conditions permit, will be made available to the packaging field.

Several of the Singer sealers were used during the war by some of the leading packaging converters for the formation of aircraft engine and parts bags of Saran and Pliofilm. The present model includes several improvements intended to fit it for general purpose sealing on a wide range of materials.

The machine will handle materials in gauges from .002 in. to .050 in., forming a narrow continuous weld at a speed, in the thinner gauges, as high as 35 ft. a minute. This speed is said to be about $3\frac{1}{2}$ times as fast as the earlier types of electronic sealers.

There is a continuous wheel feed, motor-driven, which leads the material between electrodes through which the high-frequency current, at 60 megacycles, is passed. This current is converted from ordinary 110-volt AC current to which the machine is plugged in. A toggle-type guide wheel, which carries no current, helps to guide the material. Operation of the power drive is controlled by the large treadle at left in Fig. 2; the middle pedal is the "lifter" which lifts the sealing mechanism off the work, while the pedal at right controls a unique duplex speed attachment.

By adjustment of the dials on the right side of the machine head, the sealer can be changed to a slower rate of feed and greater power to handle thick materials. The machine will operate at this reduced feed as long as the pedal at right is held down; when the pedal is released, it will revert to normal feed.

The radio equipment which produces the high frequency current is housed in the black metal cabinet which appears at the right in Fig. 2. The drive motor is slung directly beneath the sealing table. The head of the machine and many of the other parts are exactly the same as used in conventional sewing machines.

To the right and behind the sealing mechanism, as shown in Fig. 1, there appears on the platen of the machine a dial which controls a variable tuning condenser. Each material to be sealed has its own "wave length" at which the most effective seal can be obtained, and this dial permits the operator to "tune it in" exactly as a radio is tuned.

The machine is said to be foolproof and perfectly safe for even an inexperienced operator. The possibility of the operator getting a shock is very remote, as when the machine is in operation the material being bonded covers the lower or live electrode. There is no heat whatever except in the lower electrode and this becomes hot only when the machine has been running for some time.

* "Sealing by Electronics," MODERN PACKAGING, July 1943, p. 110.

The action of electronic sealing is quite complex, but essentially it consists of a violet momentary agitation of the molecular structure of the material at the point through which the high-frequency waves are passing. This creates, instantly and uniformly through the thickness of the material, high heat resulting from molecular friction. The thermoplastic material thus affected fuses together into one entity. The only heat is within the material itself and this lasts such a tiny fraction of a second that no heat is really apparent.

The same principle is used in plastics molding to heat large pieces of molding material more quickly and more uniformly than would be possible with any other method.

The great advantage of the method in heat-sealing is that the heat is always uniform; it is exactly the same at the sealing surfaces as on the exterior surfaces. In ordinary heat-sealing with heated bars or wheels, on the other hand, the heat must penetrate through the material and the exact temperature at the critical sealing surfaces is difficult to determine or control.

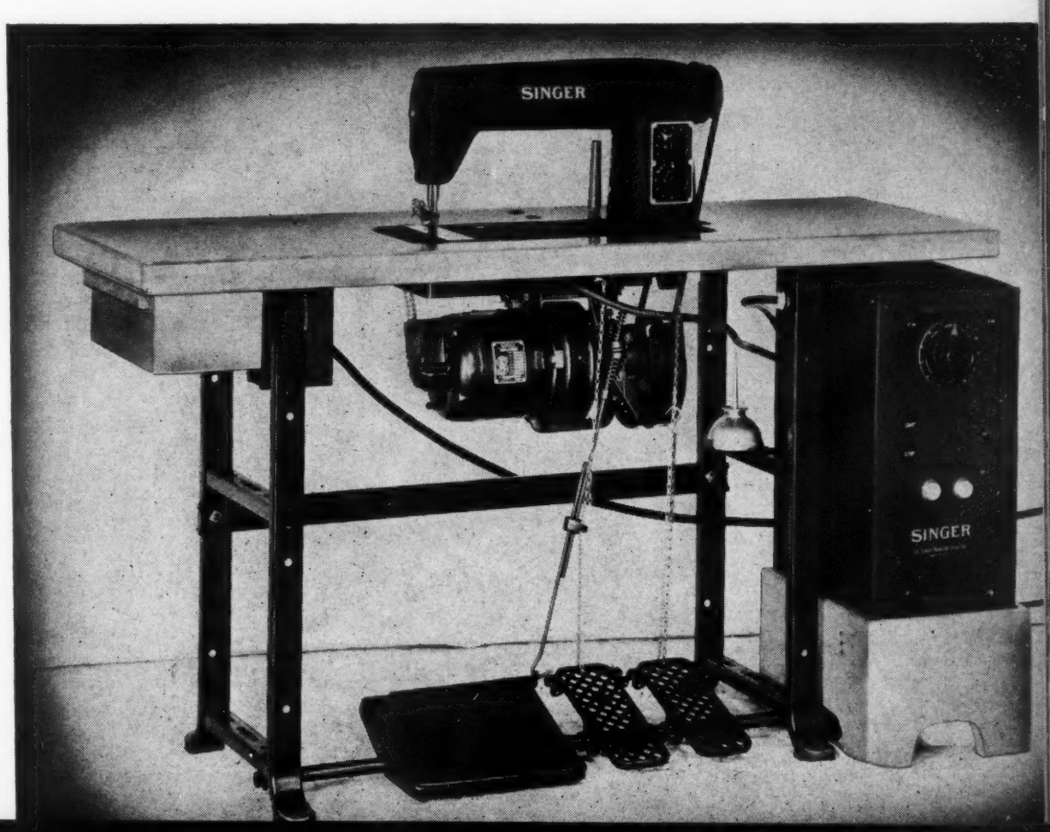
There is one important restriction on the use of this method. It is effective only on dielectric materials. This includes nearly all plastic films useful in packaging and most materials with thermoplastic coatings. It is not effective, however, on metals or metal foils even if coated with thermoplastic materials, since the metal is a conductor of electricity and interrupts the necessary high-frequency circuit.

Among the materials successfully handled by the Singer machine are Pliofilm, Vitafilm, Koroseal, any of the vinyls, and Saran. Experiments with polyethylene film have not been too successful, as the material appears to have a very critical sealing point. Any thermoplastic-coated papers, including coated glassines and parchments, are successfully handled. The Singer machine has not been tested on heat-sealable cellophane, but previous electronic sealers have reported some difficulty with cellophane, which may possibly be eliminated with further research and adjustment. Electronic sealing is not successful with ordinary wax coatings, which appear simply to melt without fusing, but it is effective on wax compositions which have resinous modifiers, either thermoplastic or thermosetting.

In their experiments with hundreds of different materials, Singer engineers have discovered many unusual factors which must be taken into consideration in getting an effective seal. Colored plastic films are more difficult to seal in certain colors than in others; it is believed that the inks or dyes affect the dielectric qualities of the material. Films with an oily or waxy surface are difficult to handle. Variations in thickness of some films cause trouble, although as long as the gauge is uniform it makes no difference whether the film has been produced by casting, calendering or extrusion. It is emphasized that the machine must be carefully adjusted to the material to be sealed and it is for this reason that the handy "tuning" dial has been built into this unit.

Further development of the machine may get away from the distinctive sewing-machine head. Engineers see no reason why high-frequency current would not be equally effective passing through the metal jaws of a conventional heat-sealing machine. This raises the possibility of creating electrodes of special shape to fit particular package shapes to be handled in jaw-type sealers. With such a machine, time and pressure factors could be regulated independently of temperature—which with high-frequency always remains constant regardless of room conditions or the amount of work the machine has done.

CREDIT: *Electronic heat-sealer, Model 248-2, by Singer Sewing Machine Co., New York.*



2—*Over-all view of machine. Dials permit adjustment of wave length to suit material being handled. Foot treadles control operation, but work is motor-driven through sealer at speeds up to 35 ft. per minute.*

DISPLAY GALLERY

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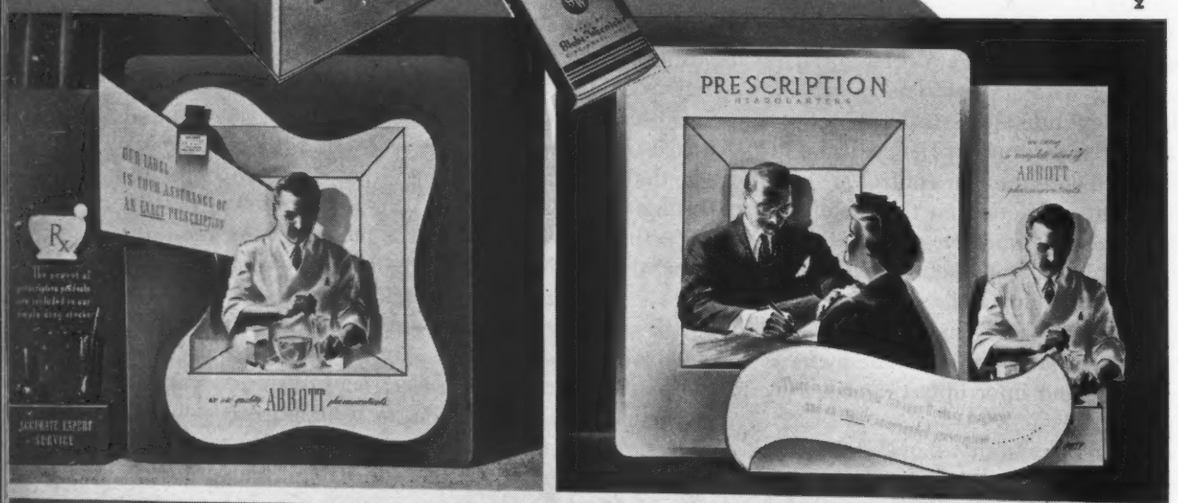

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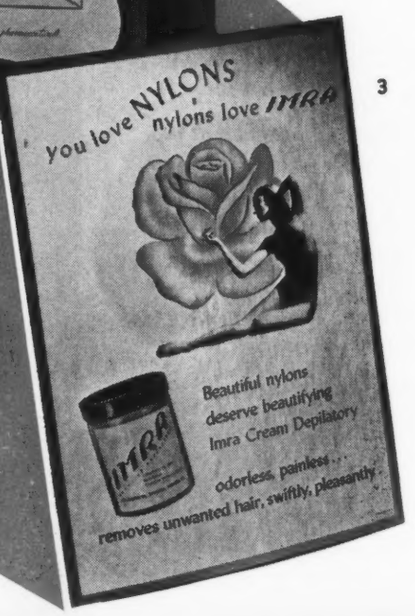
you love NYLONS
nylons love IMRA
Beautiful nylons deserve beautifying Imra Cream Depilatory
odorless, painless...
removes unwanted hair, swiftly, pleasantly

1 The new display carton for Globe-Wernicke Co.'s U-Mak-A index tabs is handy as a shelf box or as a counter or window dislay. A die-cut, easel-type lid folds forward and tucks in behind the tab packages in the carton to form the display. The display holds 20 boxes, each containing five glassine envelopes for the tab strips. Display, Central Carton Co.; Cincinnati, Ohio.

2 The pharmacist can promote his own prescription services through the new Abbott Laboratories window display. It is a four-in-one display. All or any one of the four may be used, which enables variety of arrangement. Two of the set-ups may be personalized by the druggist. His own prescription label may be attached to the space on the bottle appearing in the upper left-hand photograph. The personal signature of the registered pharmacist or the name of the store may be added to the scroll of the lower left-hand display. Display, Magill-Weinsheimer Co., Chicago.

3 Current interest in nylon stockings is recognized in a counter-display piece used as a background for packages of Imra depilatory. This up-to-the-minute promotion emphasizes the need for hair-free legs now that nylons are starting to come back. Across the top of the display appears the theme "You love Nylons, Nylons love Imra." Point of interest is the familiar silhouetted feminine figure against a large rose. Generous white space emphasizes sharply the Imra package reproduced in the lower left corner. Display, A. J. Lipp Co., New York City.

4 New Astring-O-Sol mouth wash display helps the druggist sell related merchandise. A two-shelf space is provided for holding bottles of mouth wash. Below is a small bin for related denture items such as tooth paste, tooth brushes and dental floss. The display measures $10^1/_2$ by 12 in., small enough for service counter use. Display, Forbes Lithograph Mfg. Co., Boston, Mass.

5 International Plastic Corp. of Morristown, N. J., is distributing a self-service display carton for its new line of Taypit self-sealing transparent tapes. The unit comes to the dealer in three pieces and is set up into a counter display which tilts toward the shopper by means of a stand. This provides the customer with a better view of the product. The display features the Taypit trademark and holds twenty-four 10-cent rolls of tape. Display, Universal Folding Box Co., Inc., Hoboken, N. J.

6 Seaforth is using its Scotch name to tie in with its new window display. The display features a miniature Scotch castle. It is three dimensional and in full color. Cut-out windows in the castle's towers provide platforms on which Seaforth jugs may be placed. Separate side pieces accompany the central display. These, too, are three dimensional and in full color. They enable stores to adjust the display to the width of their windows. Display, John M. Haass Litho Co., New York City.

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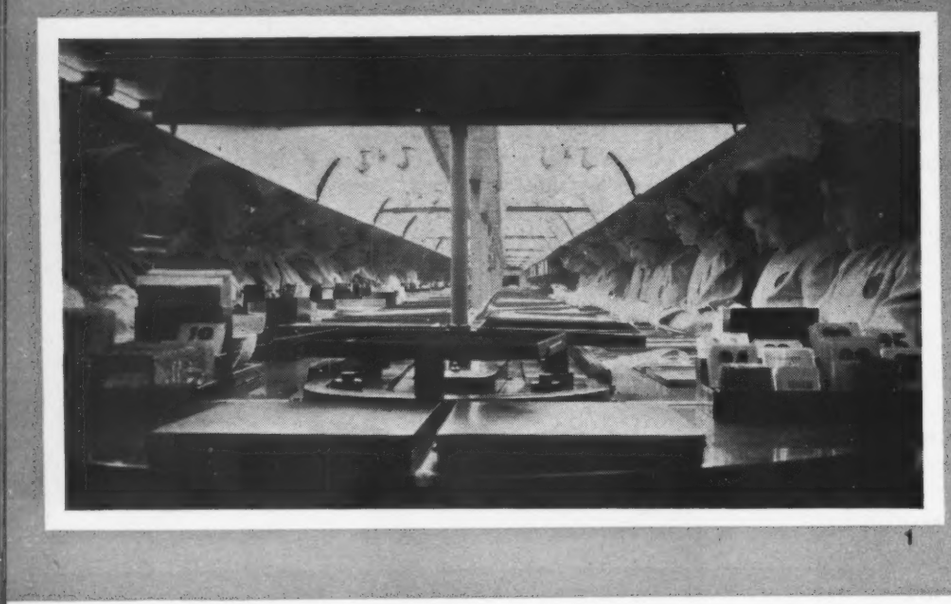

1—*So meticulous are requirements in handling high-precision, anti-friction bearings that the typical inspection and packaging line shown here takes on a clinical aspect.*

PHOTOS, BALL & ROLLER BEARING INFORMATION CENTER

Packaging of bearings . . . tremendous trifles

The war's continuous demand for smaller, more precise and stronger anti-friction bearings, combined with the war's global scope, created some interesting new problems in packaging.

It was necessary to deliver these "tremendous trifles" —a War Department phrase—everywhere, through any condition of cold, heat or humidity.

Many of these bearings were far more accurate than the parts of a Swiss watch. And, since they were so vital to mechanized speed-war of all kinds—such a war could not have been fought without them—it became top-priority-plus that they arrive at all points in perfect condition.

Many lessons learned are being carried over to peacetime applications in many industries which manufacture high-precision products.

No product is more exacting in its protective packaging requirements than the high-precision bearing. The bearing industry learned volumes about packaging during the war, and many of its practices—air conditioning, dust and lint-free rooms, the Precipitron air cleaner, anti-corrosion cleaning and wrapping—are being carried over into peacetime operations, offering ideas to other industries which may benefit by keeping packaging departments scrupulously clean.

The bearing industry itself has turned easily from war to peacetime production. There was a large reduction, of course, in the demand for the smallest types of bearings—such as those used in aero instruments, bombsights, etc.

War's constant demand for greater strength in more compact design—for bearings which could revolve at higher speeds, for longer periods, while carrying greater "loads"—really rates as fine preparation for the now growing peacetime industrial demand. Smaller bearings "will do more work" and thus industry is developing many new applications. Since industrial type bearings are for immediate use—and, neither hazardous journeys nor long storage are usually involved—the requirements of the commercial packaging are not as rigorous as were specifications for overseas shipments.

The packaging problem of the anti-friction industry involves, fundamentally, the *protection of precision*—of the new precision achieved in manufacturing processes.

Merely sound packaging is not enough to protect that. Preparations for shipment—for the kind of shipment which would insure that each of these precision gadgets went into action in perfect condition—had to start on the assembly line. One of the war lessons now accepted without question is the conception of the packaging operation as starting with preparation for packaging.

In finer bearings, chiefly for aviation use, the industry achieved tolerances—between balls or rollers and the

inner and outer rings which held them—that were measured in thousandths of an inch. Spherocity of balls and smoothness of surfaces literally were checked in millionths of an inch.

Although these bearing parts were made from the highest quality and purest steel known, and were successively hardened and toughened, as to surface, by various heat treatments, it was necessary to give them the most rigid protection during the final stages of manufacturing operations.

A bit of moisture condensation from the air; perspiration from a hand; the tiniest touch of acid, as perhaps from a lunch-box orange, might be enough to mar the accuracy of a vital bearing for a Norden bombsight—which contained, incidentally, 61 bearings of 25 different types. And a microscopic inaccuracy in a bearing, engineers estimated, could cause a high-flying bomber to miss its target by several hundred yards.

Bearing manufacturers doing precision work now

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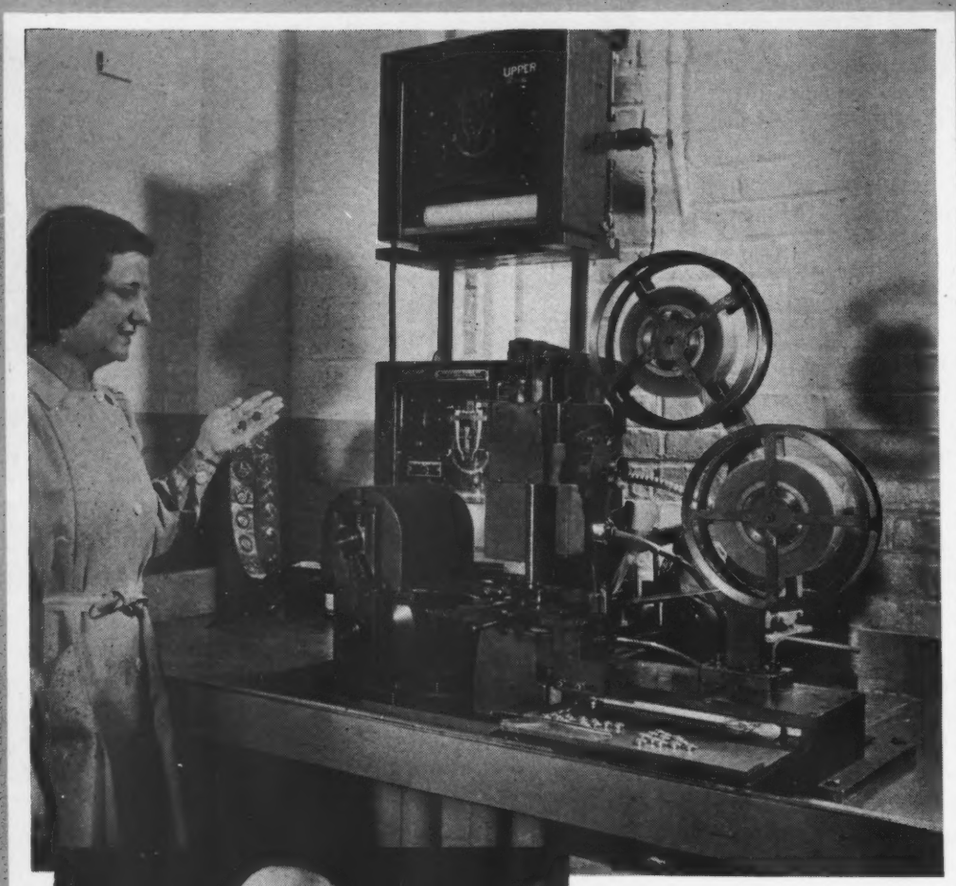
2—*Preparation for packaging starts at the doorway, where specially treated mats remove dust from worker's shoes.* **3**—*Some bearings are so tiny that a hypodermic needle is used to place a drop of oil in each one prior to packaging.* **4**—*Small bearings travel from final assembly line to air-conditioned packaging room in sealed jars filled with a highly refined oil. They enter through double windows, as precaution against outside dust; air pressure is kept higher inside packaging room as a further safeguard. Workers wear caps and smocks of special lint-free rayon.* **5**—*Tiny bearings are lifted from protective liquid with tweezers and placed in bottles of same liquid and closed with Cork-N-Seal cap and cellulose tape.*



6

6—One of the ingenious new developments is this machine which automatically heat seals small bearings in pockets between two strips of cellophane. Its rate is as high as 1,800 bearings an hour. Strips are snipped into 10-bearing units for shipment.

7

7—Part of the inspection procedure for the larger precision bearings includes listening with a stethoscope as the bearing rolls. The tiniest "click" caused by a microscopic irregularity or flaw can thus be detected.

guard against this throughout several operations: final cleaning, inspection, dimensional gauging, assembly, friction testing, packaging and shipping.

The workrooms where these operations take place are carefully air conditioned. Humidity, temperature and air pressure are controlled.

In addition to standard air-conditioning practices, in some cases the air receives further purification through the use of a recently developed electronic device—the Precipitron.

It appears that all matter, whatever its nature and however infinitely small, will take an electrical charge, positive or negative, according to its nature. Therefore, air which already has been cleaned by a series of filters is blown into a little cabinet in which a series of charged wires throw off electric radiations, positive and negative.

This "charged" air then passes on between a series of plates, alternately charged positive and negative. Any particle—now charged—left in that air is attracted in passing to a plate carrying a charge opposite to its own.

It is said the air which emerges is so completely purified that it is impossible to "grow a culture" from it. Even such things as the non-filtrable flu virus cannot escape this device. Obviously, it will have other applications in food and drug packaging, with air conditioning.

Small assembled bearings, or parts to be assembled, come into such "chemically pure" workrooms, in jars, through double-windowed openings covered by a special light oil (Fig. 4). Hands do not touch them. The air pressure within the rooms is kept higher than the outside barometer reading. Thus when a door or window opens, air moves outward; outside, dust-laden air can't blow in.

Most of the workers are women. They have been found to be more deft, patient and careful than men for these "dainty" operations.

Even dust blown onto clothing on the way to work may harm a precision bearing's super-surface. So, employees enter this "chemically pure" zone of bearings manufacture through "de-dusting" cabinets. There, a blower arrangement removes any foreign particles that may have adhered to stockings, dress or other clothing. At the doorway, a mat treated with an adhesive removes dust and dirt from the shoes (Fig. 2).

Employees—and, any visitors admitted—must wear smocks and caps. These are of rayon, which has been found to be more lint-free than other materials. Kid gloves are worn. Special rayon cloth is used in wiping oil to avoid lint.

Work tables are of stainless steel or glass topped. Lighting is of the best (Fig. 1). There is a hospital air about such places. Women with hypodermic needles (Fig. 3) place measured and uniform drops of fine oil on each of a trayful of tiny bearings. In one testing operation, a man listens to the rolling of a bearing through a stethoscope (Fig. 7).

Bearings are moved from one operation to another in rust-preventative trays; and, even in this pure atmosphere, bearings are placed between sheets of cellophane. Any notations regarding operations already performed are enclosed in cellophane cases—because paper must not touch the bearings.

Even ordinary pencils are taboo, because graphite might infect the air. Any really "must" clerical work is done with special pencils having very hard lead—and no erasers!

Microscopic examination is a part of the inspection system.

The need for the highest degree of protection of instrument bearings for overseas shipment during the war led to the development of an automatic machine novel to this industry which heat seals each small bearing individually in cellophane in continuous strips. The package is similar to one used in recent years for strip-sealed drug tablets and other items, but it was

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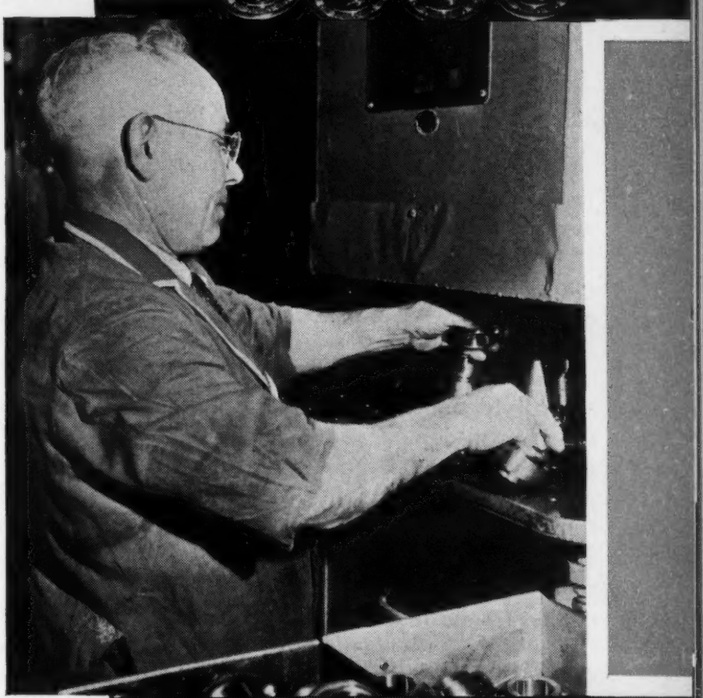

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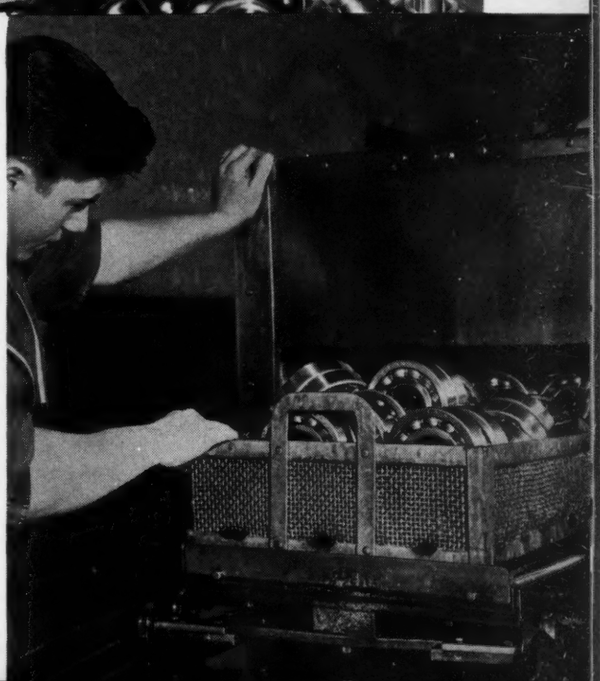

8—Larger bearings get a slush bath in cleansing oil at start of packaging operation. **9**—*Bearings 2 to 3 in. in diameter are placed on cones around circumference of revolving table. Cam lifts each cone until bearing is flush against spray nozzle, which applies cleansing oil with enough pressure to reach all surfaces.* **10**—*Another cleansing method is shower bath. Basket of bearings mounted on roller carriage is seen entering shower cabinet.*

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11—*Medium-sized bearings for industrial use being wrapped. Baskets of bearings proceed from cleansing department on conveyor at right. Room is air-conditioned.*
12—*This type of packaging represents minimum protection for commercial bearings not subject to hazardous shipment or long storage. War-time, anti-corrosion wraps are used.*

specially designed and built by the bearing manufacturer for this job.

The machine (Fig. 6) is driven by a fractional horsepower motor, using standard 110-volt current. It is fully automatic, containing indexing equipment for applying bearings, metering device for lubrication, and rolls of cellophane. Using a standard du Pont cellophane, $1^1/_4$ in. to 2 in. wide depending on bearing size, the machine individually seals bearings in strips—"by the mile," as its operator says. Its capacity is the amazing total of 1,800 bearings an hour in smaller sizes and proportionately lower for larger sizes. The strips are snipped into 10-bearing units for convenience in handling.

An interesting quirk here is that at first some bearing casings burst when transported by plane at 40,000 ft altitude. This was quickly remedied by an adjustment which left a little more space around the bearing as it was heat sealed.

Other small bearings are shipped in little glass vials filled with a highly refined rust preventative (Fig. 5). For these there is lever-type closure or a plastic threaded top, and usually cellulose tape is applied as an additional seal. For micro-instrument bearings, plastic tubes also are used in packaging. Cap and tube have the additional protection of a cellulose band seal similar to that used on the tops of liquor bottles.

The need for much of this almost microscopic and definitely clinical care can be recognized more readily when the size of some of these bearing assemblies is considered.

One "peewee" ball bearing is 2.7 millimeters, or about an eighth of an inch, in outside diameter, little bigger than the head of a pin. Held in its precision races are three one-millimeter balls—about $^1/_{25}$ of an inch! Another, four millimeters in diameter, contains six balls. A teaspoon will hold 7,000 of these tiny "steel marbles."

Larger bearings manufactured for industrial use—as for the now rapidly growing automotive demand—do not require quite the same meticulous final stages of assembly, inspection and packaging. One reason, of course, is that they will be put to work quickly by their various purchasers.

Even here, however, the practice of keeping all bearing parts clean and protected against corrosion throughout the many stages of production is general. Also, there is a growing use of air conditioning in the departments in which such commercial-pack bearings receive their final cleansing and protective coating, and are wrapped and packed for shipment.

For example, one oven-like device (Fig. 10) actually is a sort of warm shower compartment. A wheeled basket of bearings—5 to 6 in. in diameter—moves along a track into the cabinet where the bearings are given a

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warm shower of special cleansing oil until they themselves are warmed to about the temperature of the liquid.

When this bath is finished, the warmth of the bearings and the texture of the oil combine to give desired results; the cleansing fluid drains off to the right degree, leaving no over-thick deposits at any point, and the thin coating which remains is just right for protection against corrosion.

The cleansing and protective "shower" for smaller bearings—2 to 3 in. in diameter—has more pressure behind it, in order to be very sure that the smaller interior appertures are cleaned and oiled. The bearings are placed on a series of cones arranged around the outside of a revolving circular table within this type of "washing machine" (Fig. 9). As they move inward and around, a cam lifts each cone until its bearing is flush against a spray nozzle from which the cleansing compound emerges with considerable force. Complete penetration of the inner assembly is assured.

The cleansing oil itself then receives a three-ply cleaning and is used repeatedly. It passes through settling tanks, a centrifugal separator and filters.

Specially treated types of paper are used for most commercial pack bearings. Practices among different manufacturers vary according to their past experience, but not greatly. Any type of paper considered for use must undergo rigid tests as to strength, flexibility and rate of aging, as well as its acid content and greaseproof qualities. Tests are made under (*Continued on page 174*)

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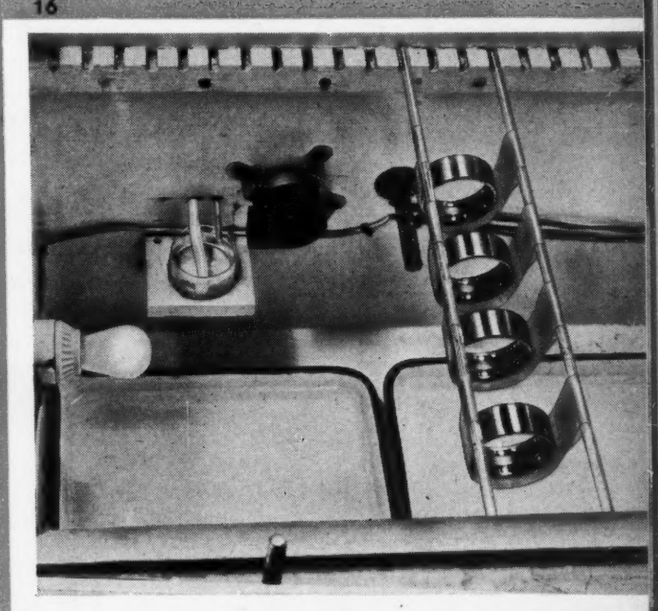


13—*Close-up of typical bearing for automotive use. It is carefully cleaned, oil-coated and wrapped in greaseproof paper that excludes moisture.* **14**—*This "doughnut" wrap, as developed during war, uses specially treated cloth and is heavily dipped in wax after wrapping.* **15**—*Example of heat-sealed envelope, a lamination of foil, asphalt and paper which is virtually zero in water-vapor transmission.* **16**—*Packaging materials are tested by bearing manufacturers for acid content, flexibility, aging and grease- and moisture-resistance. In sling test, samples of paper are tested under controlled humidity, with and without protective coatings.*

Corkscrews that work . . . a scientific analysis

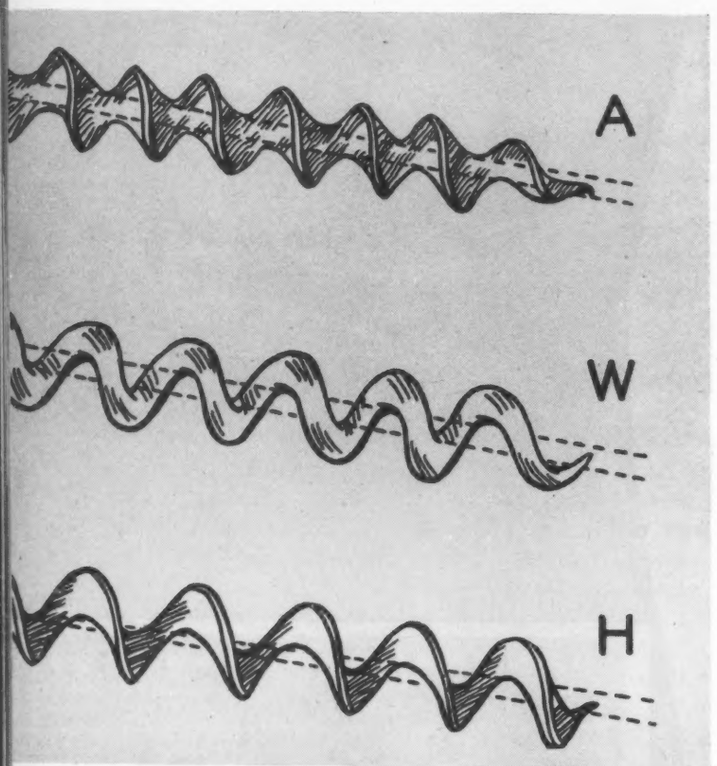
*by Paul Fredericksen**

Corkscrews capable of always removing tightly seated corks unbroken from bottles are so few and so necessary that it was thought manufacturers and users, as well as packagers of cork-stoppered products, would benefit from research into corkscrew construction.

The study herein described† was undertaken at San Francisco by the Wine Institute in the form of a research project for the Wine Advisory Board. The cooperation of Dr. Leonard B. Loeb, Professor of Physics at the University of California, was enlisted. I. F. Schnier Co., closure distributors, participated.

Eighteen corkscrews of American and European types were collected for testing to determine which would perform most successfully and, if possible, to learn why. The gauge of success was to be the unfailing removal, in one piece, of long commercial corks tightly seated in wine bottles—the most difficult type of extraction commonly met.

1—Three types of corkscrew worms: A, the auger type, with a metal core, or shaft, along its axis; W, the wire-helix, with a hollow center, uniform in diameter; H, the web-helix, with hollow center and web construction.



The corkscrews fell roughly into the three classifications illustrated in Fig. 1 (for the corkscrews see Figs. 2, 3 and 4):

1. *Auger type:* those having an unbroken central shaft of metal along the axis for most of the distance from shank to point. Corkscrews A-1, A-2, A-5, A-6, A-7, H-2, H-7.
2. *Web helix type:* having the metal so cut away between threads that no continuous shaft of metal could be found along the axis. Corkscrew H-1.
3. *Wire helixes:* those formed of bent wire with an inner diameter in which no metal appeared. Corkscrews W-2, W-4.

Others were combinations of these types.

The worms, or screw portions, differed in length, diameter, pitch and other proportions. Some corkscrews were equipped with leverage devices; others not.

Eighteen corkscrews were tested first by the handpull method on No. 9 corks $1^3/_4$ in. long which had been inserted 15 days earlier in standard fifth-gallon-sized bottles of Bordeaux type of recent manufacture.

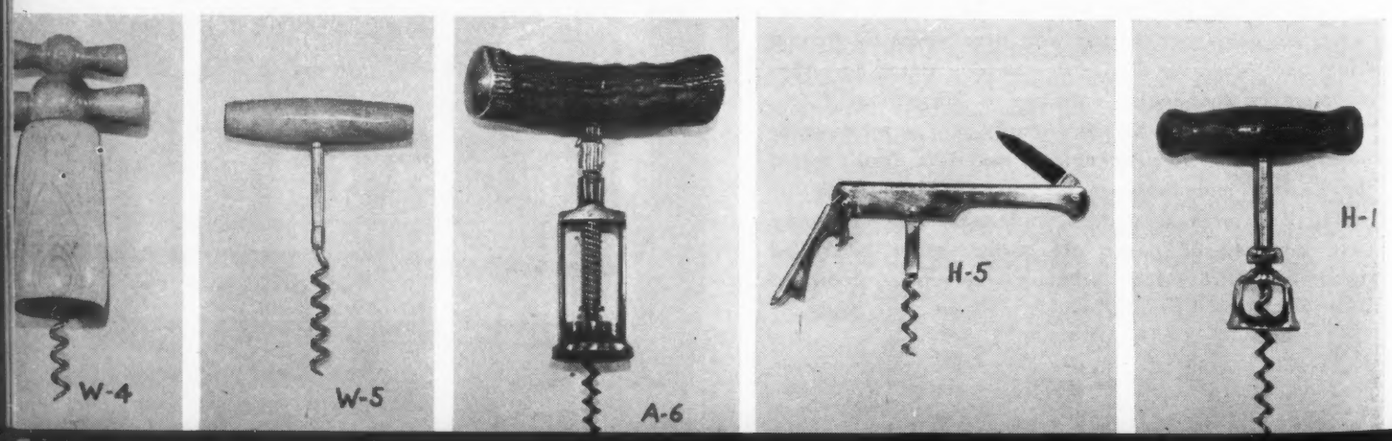
A number of factors were not constant. In some cases corkscrews penetrated through the cork fully;

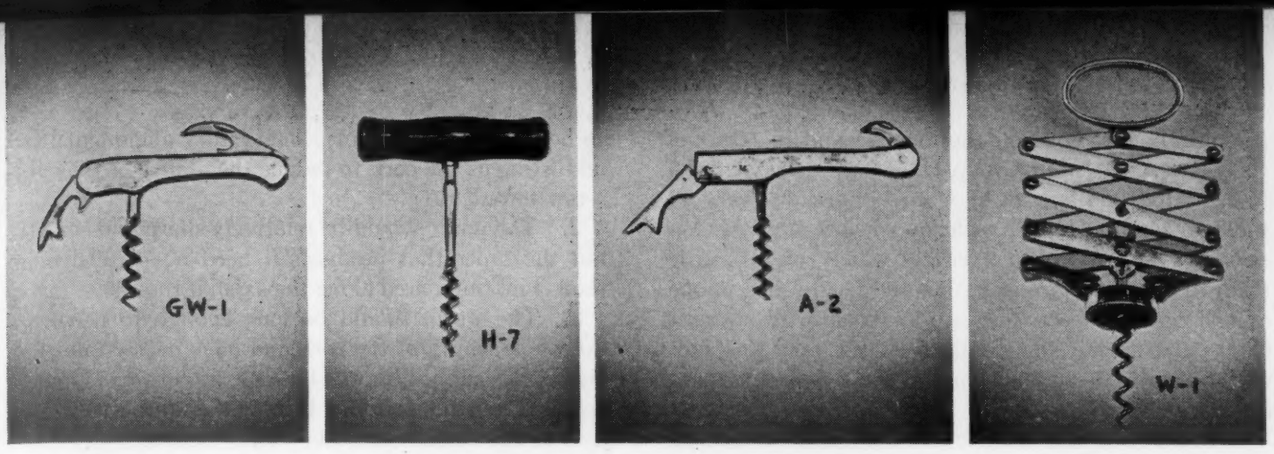
* Of the Wine Institute, San Francisco.

† Complete text of the report may be obtained from the Wine Institute, 717 Market St., San Francisco 3.

CORKSCREWS OF GROUP I

2—Tests showed these five corkscrews to be most efficient, from left to right in order of performance. Leverage devices did not enter into tests, but they were found essential in some form for opening wine bottles.





CORKSCREWS OF GROUP II

3—*This group ranked second in over-all performance; lowest reading in pounds of pull-through being 190.*

in others they did not and apparently lost in efficiency. Some corks proved easier to pull than others. To provide greater uniformity of conditions it was decided to conduct quantitative tests of corkscrew worms without the use of the various leverage devices and with the use, wherever possible, of full penetration.

Quantitative tests

Two quantitative tests were held, both at the testing laboratory of Smith, Emery & Co., San Francisco, with the aid of a Scott inclination balance testing machine (Fig. 6).

For the first test, selected, hand-cut No. 10 corks $1^3/_4$ in. long had been driven into dry, empty Bordeaux-type bottles 16 days beforehand. Each corked bottle was placed in a specially built jig and pulled downward at the rate of 10 in. per min. while a corkscrew imbedded in the cork was gripped at the top of its shank and held stationary. The testing machine constantly recorded on a dial the poundage of the pull, including the pull-through point in case of failure and the amount of pull reached in successful removals. Twenty-two corkscrews were tried in this test. Each corkscrew was subjected to four measured pulls.

This test demonstrated the wide variation in pull needed, even by a single corkscrew, to extract four corks inserted under uniform conditions. Corks were successfully removed with pulls ranging all the way from 121 to 302 lbs.

In view of such disparities there seemed only one way with the materials at hand to test the relative efficiency or gripping power of all the corkscrews. That way was to use cemented-in corks that could not be removed by any available corkscrew and to record the poundage at which they would pull through.

For the test with cemented-in corks, selected hand-cut No. 9 corks $1^3/_4$ in. long were sealed in Bordeaux-type bottles 20 days beforehand with the use of du Pont household cement. Eighteen corkscrews, each long enough to penetrate the cork fully, were tested with measured pull on four corks. If any of the four pull-through readings seemed far out of line with the other readings of the same screw, it was eliminated and the reading from a fifth test was substituted.

The corkscrews were ranked in terms of performance. Since what was wanted was the measure of the point at which a corkscrew would not fail, the ranking was on the basis of lowest instead of average readings. Ranking based on lowest readings fell into three groups:

	Corkscrew	*Highest Reading in Lbs.*	*Lowest Reading in Lbs.*	*Average Reading in Lbs.*
Group I	(See Fig. 2)			
1	W-4	292	276	283.5
2	W-5	305	244	276.7
3	A-6	270	230	248.5
4	H-5	268	218	238
5	H-1	268	214	247.5
Group II	(See Fig. 3)			
6	GW-1	248	202	229.5
7	H-7	240	196	225.5
8	A-2	284	192	224.5
9	W-1	248	190	217.5
Group III	(See Fig. 4)			
10	H-4	260	188	225.8
11	A-1	266	186	235
12	A-5	204	184	194
13	H-2	228	182	201.5
14	H-8	184	167	177.8
15	H-6	175	162	168.8
16	A-7	238	158	196
17	W-2	175	157	163.5
18	H-9	244	155	196.3

The worms in Group I had shown by far the greatest

Because the removal of tightly sealed corks has been a troublesome question in the packaging and sale of wine—where the cork is preferred above more modern closures for aesthetic reasons—the Wine Institute has just completed a scientific analysis of corkscrews, which is presented here in condensed form. The conclusions upset some previously cherished theories. They will be interesting to all packagers who use cork stoppers.

gripping power, both on the average and in terms of their lows. Those in Group II had averages of 217.5 to 229.5 lbs. and lows of between 190 and 202 lbs. Of those in Group III, all with lows below 190, the top two, H-4 and A-1, had averages which might entitle them to belong in Group II, but they had failed in one or two cases, respectively, in four trials with straight hand-pulls during the qualitative test and this fact would seem to be an additional reason for placing them in Group III.

Dimensions of the corkscrews were now studied to determine how their construction influenced the performance of each.

Conclusions

From this study it was not possible to set forth firm, complete specifications for the best corkscrew it is possible to make. Final conclusions, of course, would require a series of tests in which all elements were uniform except the one element being tested—a set of conditions not possible in this study. However, pending such a series of tests, analysis of the results noted thus far would appear to warrant the following recommendations:

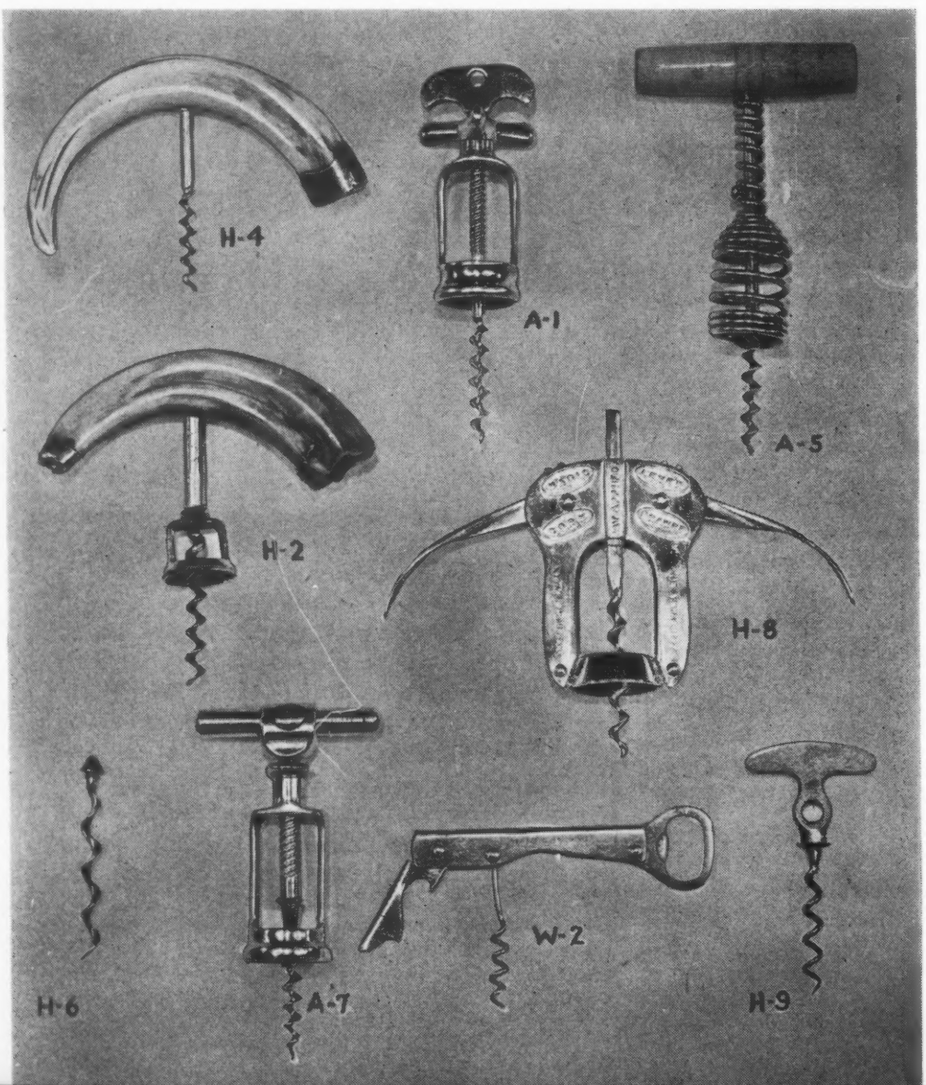
1. In all cases the point should be aligned to lead the following worm cleanly into the cork along a single path for both. Under no circumstance should the point move inside, or outside, or above, or below, the path to be filled by the worm; such faulty alignment tears and weakens the cork to reduce the ability of the corkscrew to pull it.

2. The point should be relatively sharp and smooth, but the taper that produces it need not extend more than .4 in. (measured along the axis), if that far.

3. The worm should be long enough to penetrate the whole length of the cork and have nearly full bearing surface supporting the base of the cork from underneath after penetration. It is not desirable that any part of the shank enter the cork. Because some wine bottles have corks fully 2 in. long and because of the need of getting a purchase below the base, the ideal corkscrew should be made with the worm itself capable of entering a cork at least 2.25 in. before the application of any leverage. In any event, the longer the worm, up to that length, the better.

4. Although some sharp-edged corkscrews showed satisfactory performance in a straight, non-turning pull, it appears as though knife-sharp edges are not necessary and probably are to be avoided, particularly in corkscrews equipped with turning leverage.

5. While a perfect correlation between diameter and performance of worm was not obtained, the highest scores in measured pulls were definitely shown by worms having an outer diameter of .35 in. and above. The widest worms tried, .39 in., removed corks; they were difficult to insert, however, without running toward the



CORKSCREWS OF GROUP III

4—These corkscrews were poorest of the 18 ranked, their lowest pull-through poundage ranging from 188 to 155.

(Page 132)

side and splitting corks in a manner aesthetically objectionable.

6. The tests indicated that highest performance was given by worms having pitch—the distance along the axis between centers of spirals—of .40 in. and .35 in. A reason may lie in the weakening of cork structure by shorter pitch and lack of adequate bearing surface in the case of longer pitch. Uniformity of pitch would seem desirable.

7. While the five corkscrews of highest gripping power included one of auger type, one of modified helix type and one with a web helix, the two leaders were wire helixes, and the general impression was that round-wire helixes corresponding to the limitations set forth in the recommendations above gave the best performances despite the fact that it was not always easy to center them throughout the length of the corks. It would seem that the auger type should not have too thick a metal axis and should be devoid of any extreme tapering of its outer diameter except at the point of penetration. The wire thicknesses of the two leaders —.119 in. and .24 in.—would appear to be satisfactory in round-wire helixes.

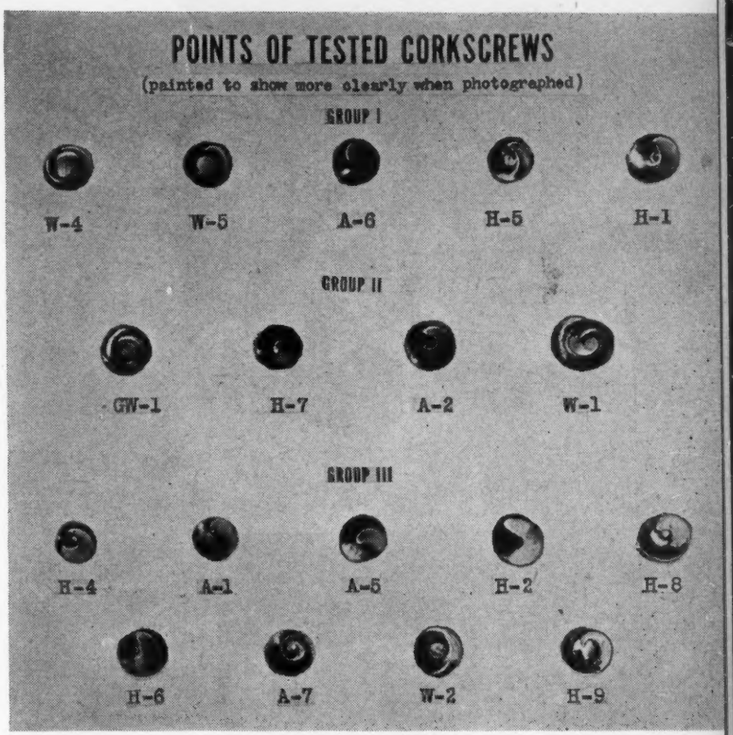
8. A leverage device is essential in a corkscrew for wine bottles. For household use, leverage devices giving a straight, non-turning pull—preferably of double-screw or other type not requiring experience for use—are recommended. Corkscrews made for use in restaurants should also have devices with this type of pull—probably boot-levers if the corkscrews are to be carried about in employees' pockets.

9. It is recognized that in wine-lovers' tradition it has not been aesthetically desirable to penetrate the base of the cork or to damage the cork greatly in removal. It is recognized also, however, that the purpose of a corkscrew is to extract the cork as completely as possible. It is recommended that the practice of not having the point penetrate the base of the cork be modified in the interests of proper extraction, since the tests fully demonstrated that penetration is essential and further that, with a corkscrew-point of proper shape and position, penetration does not result in projecting cork dust into the bottle, which might get into the contents.

10. Every corkscrew worm should be selected to be capable of pulling the most difficult cork it may ever encounter. Special attributes that might seem desirable should be discarded if in conflict with this result. It is recommended that any worm, before being marketed, should be subjected to some hundreds of tests with difficult corks; worms intended for use on wine corks should be tried on corks so tightly seated that they will not yield to a pull by a strong man without leverage.

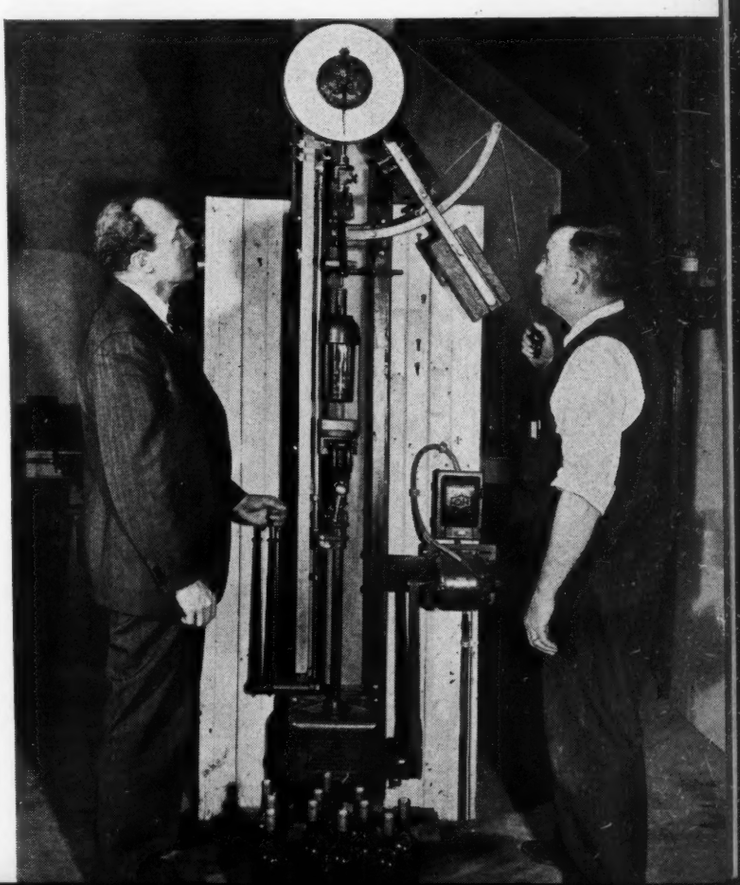
11. Worms and shanks must be of good enough quality to resist bending, breaking or losing alignment in difficult corks. It is urged, in view of the forces involved in the removal of tight corks, that the shank of any corkscrew be strongly pinned in the handle or superstructure.

(*Page 133*)



5—*Tests proved that point of corkscrew should be aligned so as to lead worm cleanly into cork along a single path. Wire helixes (W) generally gave best results.*

6—*Test of the corkscrew's pulling power being made on a Scott inclination balance testing machine. The corks were cemented in wine bottles, and the point at which the screw pulled through was registered on the dial at top.*



Packaging

1

1 A singing yellow bird is a "natural" for the trademark on cartons of a new household cleaner called "Sing," made by Hood Chemical Co. The bird has quick identity and is intended to convey the idea of household tasks made easy. Background color is blue. Brand name is in white with black outline: product name, yellow. Red is used for the bird's bill and selling copy, "Kind to Your Hands." Back panel is devoted to easy-to-read directions. Cartons, American Coating Mills, Inc. Elkhart, Ind. Design, Jim Nash, New York.

2

2 Noctil, a new Rumford product, is a water softener packaged in a folding carton coated for a glossy finish. A clean appearance is achieved by blue and green coloring. The familiar Rumford trademark in black and white appears on the upper part of the front panel. Background is an overall design of soap bubbles. Illustrated directions appear on back. Carton, Container Corp. of America, Chicago.

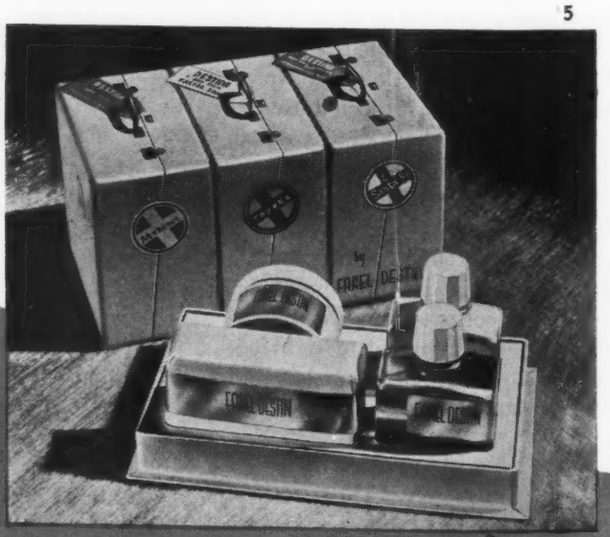
3

3 Little Boy Blue bluing bottle is now appearing with a newly designed red-and-white label and lithographed cap. A convenient feature is the center dot in the cap, where the liner can be punctured for easy application by the housewife. The cap is a standard-type crown seal. Bottle, Owens-Illinois Glass Co., Toledo, Ohio. Cap, Crown Cork & Seal Co., Baltimore, Md.

4

4 Betty Field, star of the Broadway show, "Dream Girl," is featured to promote the new cosmetic kit by Rose Laird. Six beauty aids are included in the kit. A photograph of Miss Field appears inside the lid. The underlying theme is directed to the college and career girl market. Container, Ferdinand Buedingen Co., Inc., Rochester, N. Y.

5 Farel Destin's "Atchison, Topeka and Santa Fe" kit ties in with the current song hit. It is packaged in a set-up box printed to resemble three tiny suitcases. Luggage tags with the Destin trade name are reproduced on the top. On the side are printed three stickers bearing the railroad name.



5

6 Rustic Glen Foods, Joliet, Ill., is packaging popcorn in a spiral-wound fibre container with metal ends. It is said to maintain proper moisture content for the product the year

(*Page 134*)

Pageant

around. The label has a soft green background. The trade name appears in bright rustic red and other copy in white and yellow. Container, Cleveland Container Co., Cleveland, Ohio. Label, Ackermann Printing Co., Chicago.

7 Pre-cooked and frozen French fried potatoes distributed by Maxson Food Systems, Inc., New York, are packaged in a 10-oz. carton designed to fit into the home refrigerator freezing compartment. Potatoes are first wrapped in cellophane to prevent dehydration; then placed in a carton, which is over-wrapped with heavy waxed paper. The packages are printed in red with the Maxson trademark, a smiling chef.

8 Likwid Shave, marketed by The Penetone Co., Tenafly, N. J., has printing in green and red directly on the bottle. There is no applied label. Printing on glass, Anigraphic Process, Inc., New York. Design, E. Leonard Koppel, New York.

9 Vital Foods Corp., Evanston, Ill., has a new product for that "morning after" feeling named Quartette. Each package contains one each of four different tablets. The tablets are separated in the sleeve-type box by a scored divider and a waxed paper liner insures freshness. Twelve boxes are packed in a display carton. Boxes, F. N. Burt Co., Buffalo, N. Y. Display carton, Mc-Cracken Box and Label Co., Chicago. Labels, A. M. Steigerwald Co., Chicago.

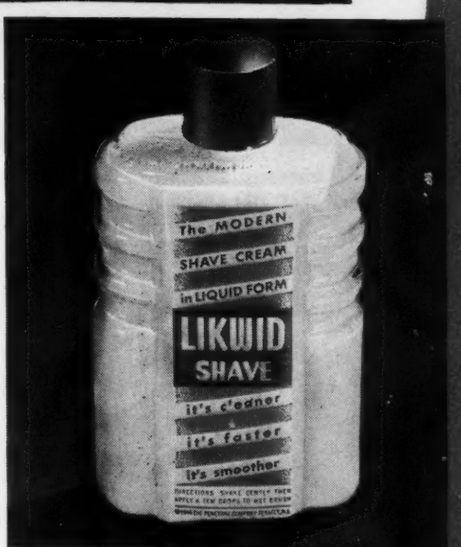
10 This practical Rotakit package for rotary files and burs has been designed in the form of a miniature bench stand. Each of the tools is easily accessible to the user. A glass front on the wooden container provides visibility and protection against dust. The package is a convenient container for the buyer and, at the same time, it can serve as a display stand for hardware retailers. Container, F. B. Hicks Co., Cambridge, Mass.

11 The three standard flavors of Standard Brands' Royal Puddings now appear in improved packages designed for greater shelf appeal. The new cartons are printed horizontally and the word "Royal" is printed in red against a

(*Page 135*)

7

8



10

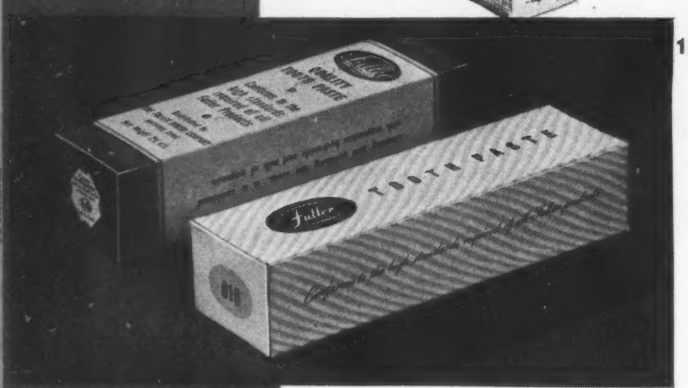
9

THE FOR THE MISERIES OF Morning After
Quartette
4 TABLET-TREATMENT
1 Tan Tablet as ALKALIZER
2 Pink Tablet as CIRCULATORY Stimulant
and to RELIEVE PAIN
3 White Tablet for VITAMIN B1 Deficiency
4 Orange Tablet as ANTACID
25¢
Quartette
FOR THE MISERIES OF THE Morning After
VITAL FOODS CORPORATION EVANSTON
Quartette
FOR THE MISERIES OF THE Morning After

Packaging Pageant

11

white background in letters 25% larger than on the old package. The lower half of the package features the color that identifies the flavor of the product. Design, Georges Wilmet, N. Y. Carton, Gilford Folding Box Co., Baltimore and Wm. W. Fitzhugh, Inc., N. Y.



12

12 The Fuller Brush man will soon deliver his products in new packages. Fuller toothpaste package expresses design theme for more than a hundred new packages soon to follow for brushes, household items and cosmetics. Because of Fuller's direct-selling program, these packages do not have to compete with others on store counters. The company, therefore, can establish identity with more design restraint than the average shelf package demands. Chief aim is to suggest cleanliness. The gray feather motif on the new carton (foreground) is light, delicate and clean. A deep teal blue is used for the trademark, product name and copy. Design program, J. Gordon Lippincott & Co., New York. Carton, National Folding Box Co., New Haven, Conn.

13

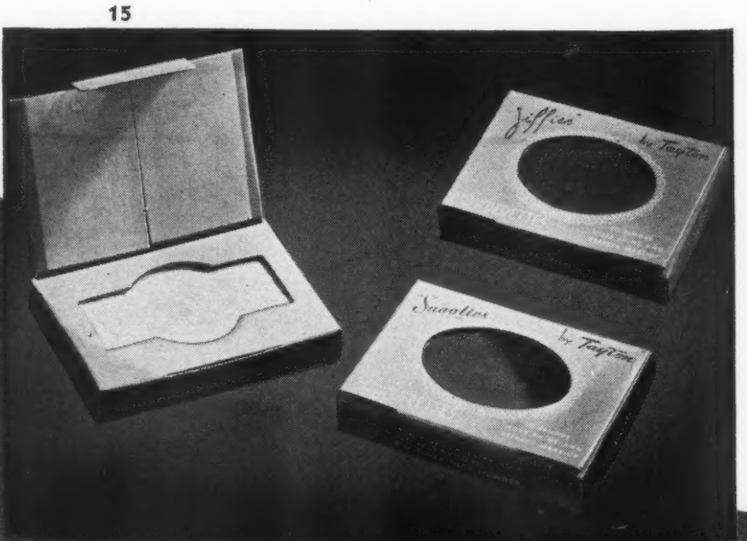
13 The dispensing package for P-W (pin-worm) tablets, made by Dr. D. Jayne & Son, Inc., Philadelphia, has been adapted for the company's P-W tablets for children under five years of age. Package consists of a set-up box within a sleeve. Set-up box is die-cut for dispensing one tablet at a time when sleeve is slid back. Pink-and-blue color scheme distinguishes children's package from the purple for grown-ups. Container, Walter P. Miller Co., Inc., Phila.

14 New "Pearlon" plastic sheeting is being used by the Traver Corp., Chicago, to make bags for household use. An assortment of seven bags of varying sizes and plastic clothespins for closing the bags are packaged for retail sale as the Household Utility Kit. The unit is assembled in a red and blue cellophane envelope. "Pearlon" is also available in stock bags and tubing for locker and freezer use.

14

15 "Jiffies" and "Snooties" are handy little impregnated powder puffs packaged in a one-piece folding carton that opens like a hinge lid box with a mirror glued under the lid flaps. Lid is die-cut to display mirror. Product complete sells for 10 cents. Carton, Ace Carton Co., Chicago.

15



Industrial packaging . . . the IPEAA conference

Problems of special significance in the field of industrial packaging and materials handling came in for thorough review at the 1946 Industrial Packaging Exposition, staged from April 24 to 26 at the Hotel Sherman, Chicago, by the Industrial Packaging Engineers Association of America.

Proof of the keen interest in industrial packaging materials and methods was evident in the excellent attendance at the packaging clinic sessions, held on all three days of the meeting, and in the close study given by visitors to more than 90 commercial exhibits set up in connection with the exposition. The first-day registration of approximately 900, swelled by additional arrivals on April 25 and 26, left no doubt that the field of industrial packaging is being given close attention by progressive manufacturers.

War lessons reflected

Running throughout the program and clearly apparent in both the commercial displays and educational exhibits were indications that the vital lessons of product protection learned in the hard school of World War II, far from being forgotten or discarded, will be reflected to an increasing extent in peacetime industrial packaging. Although industrial packaging men are fully aware that packaging for today's competitive markets must accord due allowance to the factor of cost—the significance of which frequently went by the board during the war—they are determined to translate into everyday use many of the newly developed materials and techniques.

Packaging clinic sessions of the IPEAA exposition were divided into seven principal categories—cleaning, rust preventives, dehydrating agents and plastic coatings; interior packaging; corrugated and solid fibre boxes; wirebound and nailed wooden boxes and crates; materials handling, palletizing, loading and shipping; new developments in packing and packaging general merchandise; and standards and specifications. "Packaging for Air Cargo" was the subject of a special luncheon address by Paul Burbank, of United Air Lines, on April 25.

Speaking on "Correct Cleaning Insures Product Acceptance," B. B. Button, of the Diversey Corporation, emphasized that the importance of cleaning prior to application of a rust-preventive material has been undervalued by many producers of industrial items. He cited the special properties of different types of cleaning agents and methods, including solvents, vapor degreasers, alkaline detergents, emulsion type cleaners and soaking or spraying with emulsifiable solvents, pointing out that removal of dirt-carrying oil is usually the fundamental problem involved. An effective cleaning job requires a material with sufficient wetting action, emulsification properties and deflocculating powers. Each cleaning problem, the speaker suggested, should be approached on an individual basis to insure the selection of the right cleaning material and technique.

Petroleum base coatings and films as rust preventives were discussed by F. E. Rolston, of the Dearborn Chemical Co., who stated that satisfactory coatings must bond firmly to the metal part to be protected, must be impervious to moisture, should carry a rust inhibitor and should be readily applied without the need for elaborate accessory equipment.

In a talk on "Post-War Applications for Dehydrating Agents," John G. Carroll, of the Davison Chemical Co., reviewed the use of desiccants in wartime packaging and stated that one of the main problems now facing packaging men is that of combining the highly efficient techniques of protection developed during the war with the merchandising appeal of successful pre-war packages. Among packaged products shown by Mr. Carroll in which silica gel is used to combat moisture damage were a hearing aid packed in a glass jar and several types of pharmaceutical preparations. He also referred to dehydration packaging work being conducted on food products by the U. S. Department of Agriculture.

Discussing "Plastic Protective Coatings," Norman Peterson, of the Dow Chemical Co., advocated abandonment of the term "plastic" in connection with coatings, explaining that its usage in this field had resulted in widespread confusion and had opened the way for misleading advertising claims by unscrupulous manufacturers of so-called "plastic" finishes. Mr. Peterson stated that considerable work had been done with Saran to produce a solvent-soluble resin suitable for application to paper, foil, cellophane and other packaging materials, and that it had also been prepared in a latex form for use in the spray packaging program.[1] The raw material cost for this type of packaging, running approximately 15 cents per square foot, may be considered rather high for most civilian packaging applications, Mr. Peterson said.

Merchandising job of I-H packages

Details of the comprehensive packaging program evolved by International Harvester Co.[2] were related by Fred Grede of I-H in a paper on "Industrial Packaging Appeal." Mr. Grede traced the development of automotive parts merchandising from blacksmith days to the present, reminding his audience that modern

[1] See "Saran Coating Latex," MODERN PACKAGING, March 1946, pp. 194-199.
[2] See "300,000 Parts," MODERN PACKAGING, Jan., 1946, pp. 94–99.

selling methods call upon the package to perform a sales job as well as to meet the primary requirement of product protection.

Packaging problems peculiar to manufacturers of airframes were described by Gale C. Cunningham, of North American Aviation, Inc., who with illustrative slides showed how his company, after drop tests, tumble tests and incline impact tests, had settled on the principle of attaching fragile ailerons, flaps and other components to one surface of the box only, using cradles or steel strapping. End thrust movement is controlled by various methods, but in each case an effort is made to tie back to the cradles rather than to any other part of the box.

C. S. Macnair, of C. S. Macnair & Associates, showed a series of slides depicting examples of improper packaging encountered during his wartime service at the U. S. Navy's New Orleans damaged shipment laboratory. The particular point stressed by Mr. Macnair as typical of many of these faulty packs was the fact that the products packed fitted loosely in the containers, allowing them to shift around during shipment and handling, resulting in damage to themselves and frequent breakage of the container walls.

Participants in the discussion on corrugated and solid fibre boxes included A. C. McGeath, of American Box Board Co., program chairman; A. L. Green, of the Freight Claims Division, Association of American Railroads; Walter Goettsch, of Samuel M. Langston Co., and Don L. Quinn, of Don L. Quinn Co. Mr. Green described the current efforts of the railroads to reduce loss and damage claims through improved equipment, continuing educational campaigns among freight handling personnel and encouragement of the production and use of better quality containers. According to the speaker, one of the most serious difficulties encountered at present is that of the crushing of fibre boxes, strength of which is as much as 35% below shipping classification requirements. Mr. Green estimated that at least 10% of the gummed tape applied to shipping cartons is wasted. Slides were shown illustrating typical shipping damage arising from careless or improper packaging.

Mr. Goettsch outlined the activities of box manufacturers directed toward reduction of loss and damage claims, while Mr. Quinn presented the problem from the standpoint of the shipper. The latter expressed the belief that closer study of the normal hazards of shipment and a return to better grades of packaging materials, unavailable during the war emergency, would do much toward cutting shipping damage to a minimum.

Clinic session on crates and boxes

Participants in the clinic session on wirebound and nailed wooden boxes and crates were Joseph H. Singer, of Rathborne Hair & Ridgeway Co.; Louis A. Beale, of the Wirebound Box Mfrs. Association; Gunther Carlberg, Jr., of the National Wooden Box Association; George T. Walne, of General Box Co.; Walter P. Newquist, of Maxwell Bros., Inc., and Ernest A. Amundsen, of Chicago Mill & Lumber Co.

The clinic on materials handling and related topics was under the chairmanship of Paul O. Vogt, General Electric Co. Subjects discussed included "Streamlining the Flow of Production," by Arthur H. Dobler, of Yale & Towne Mfg. Co.; "New Ideas on Palletizing," by Henry Carpenter, of International Harvester Co.; and "Materials Handling," by Ezra Clark, of Clark Tructractor Co.

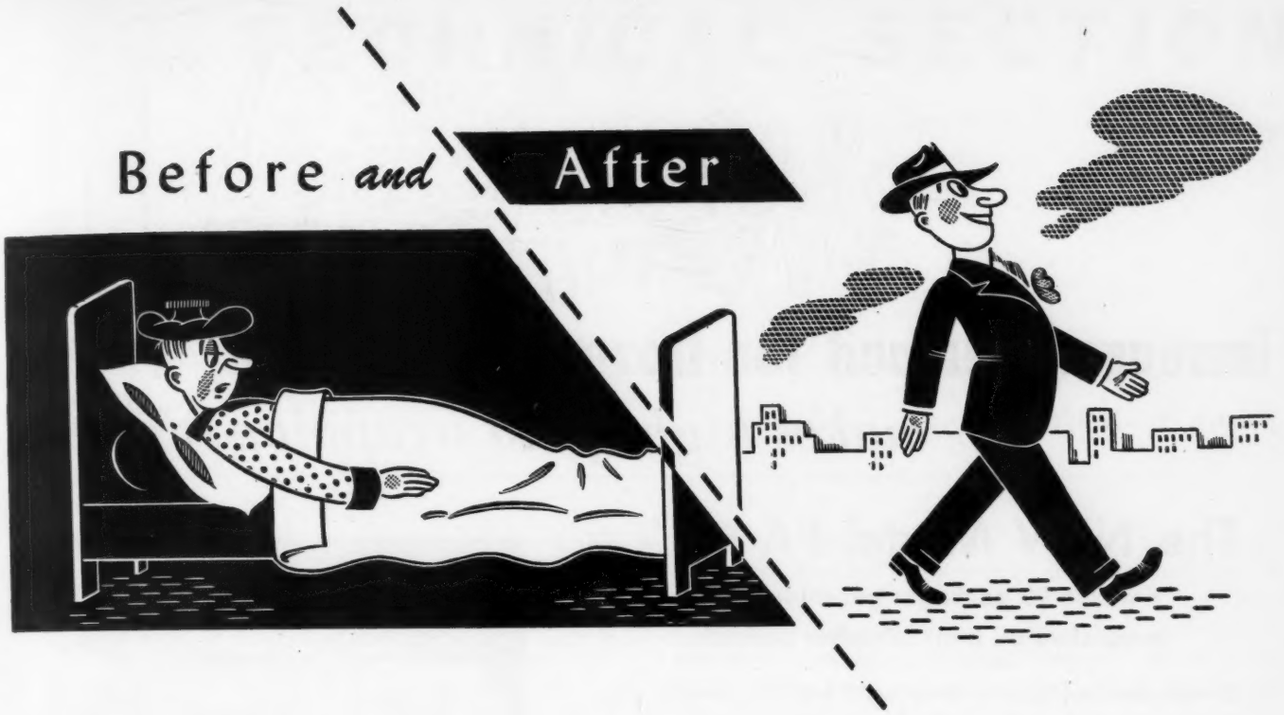
Mail order houses participate

Representatives of four large Chicago mail order houses took part in a session devoted to new developments in packing and packaging general merchandise. C. J. Carney, Jr., of Montgomery Ward & Co., acted as chairman of this division of the program. James G. Witte, of the Ward organization, speaking on "Organizing a Package Engineering Department," presented an outline of basic steps in the development, functions and objectives of a packaging department in a national merchandising organization, while R. E. Farney, of Aldens Chicago Mail Order Co., discussed "Principles of Protective Packing" as applied to such items as furniture, electrical appliances and stoves. "Informative Tagging and Labeling" was the topic of Walter Stern, of Spiegel, Inc., and "Special Marking Requirements for Retail Distribution" was the subject of a talk by W. H. Taylor, of Sears, Roebuck & Co.

The concluding clinic session, devoted to standards and specifications, featured talks by S. H. Tompkins, Crescent Paper Co.; Herbert T. Holbrook, Bulkley Dunton & Co., formerly assistant chief, packaging division, Ordnance Department; Thomas P. Wharton, assistant to the chairman, Army Packaging Board, and assistant chief, packing and packaging section, Headquarters, Army Service Forces; Lt. Comdr. C. K. Royce, assistant to the chairman, Navy Packaging Board, and vice-chairman of the technical committee on packaging for the Federal Specifications Board.

One of the highlights of the meeting was the luncheon address on air cargo by Mr. Burbank. The speaker cited the unprecedented speeds offered by postwar cargo craft and the greatly increased payloads which they will be able to handle. He predicted that practically every type of business will find it advantageous to deliver some of its products by air. The speaker called attention to the growing diversification of air-delivered cargoes and the special merchandising value of air-borne delivery for many types of products, making the development of special packages worth while.

Among the air-delivered products shown in two large exhibits illustrating Mr. Burbank's speech were flowers, x-ray tubes, portable and console radios, pharmaceuticals, dresses, hats, fountain pens, telephones, perfume, a wire recorder, radio station transcriptions, scientific testing instruments, crank shafts, clutch plates, rhubarb, celery tomatoes, lobsters, trout and live baby chicks. Many of the items (*Continued on page 180*)



Many of our customers tell us that Burt's service is the prescription for their packaging problems. They find that our automatic production saves time, saves money. And, because they are the mass-packagers of mass-produced goods for mass-market selling, they appreciate the uniformity of Burt production—the fact that the first and the millionth container are precisely alike in size, shape and color.

Also, Burt's central location eliminates many delivery delays. In today's roaring markets the speed of delivery can be as important as any other factor. These are only two reasons why Burt's automatic production of small, round, square, oval and oblong set-up boxes is relied on by leading packagers everywhere.

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Increased demand for frozen foods

makes high-speed wrapping a "must"

The NEW Model FA

- **wraps 90 packages per minute**
- **registers all printed matter perfectly**

Surveys indicate that housewives all over the country are thoroughly sold on frozen foods—and that they intend to buy more and more just as soon as dealers are equipped to supply them . . . Packers are preparing to meet this increased demand by installing the fastest, most efficient wrapping machine available—the new Model FA.

With this machine, one can turn out 90 perfectly-wrapped packages per minute. A highly improved electric eye insures the accurate location of all printed matter, regardless of the length of the run. Moreover, the type of end-fold made by the FA permits end printing to be on the top flap of the fold, thus assuring perfect legibility. Enlarged spring-floating heater units produce a neat, tight wrap even though the packages being run through may vary slightly in size. Prefrozen foods which vary up to 3/8" in width, and that have caused many headaches, are being wrapped satisfactorily on the FA. And bulging cartons are pressed into shape during the wrapping process.

Quickly adjustable for a wide variety of package sizes, the new Model FA enables you to wrap many different items on the same machine. All adjustments necessary for the change-over can be made by the operator in less than ten minutes.

Prepare now to give your products the attractive, high-speed wrapping they will need to meet competition successfully in this growing market. Consult our nearest office today for complete information regarding the new Model FA.

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Springfield 7, Massachusetts

30 Church St., New York 7 • 111 W. Washington St., Chicago 2 • 101 W. Prospect Ave., Cleveland 15
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PACKAGE MACHINERY COMPANY

Over a Quarter Billion Packages per day are wrapped on our Machines

New plastic films ... their packaging qualities

by Capt. William H. Aiken*

In recent years there has been a vast increase in the production of thin transparent films. Many of these films are manufactured from completely new materials that were still in the experimental stage before the war, while others are of increased interest for packaging because of greater availability or reduced cost. Many of the films are of little interest in the packaging field at the present time because of limitations in certain characteristics or because of high cost, but improvements in their properties might be made and the cost lowered in the next few years.

In considering plastic films for packaging, one should start with an open mind and not place limitations on what can and cannot be done in the packaging field on these materials. Plastic films have their own inherent properties and certainly cannot be expected to be handled in the same equipment and in the same manner as materials used in the past. To make progress, it must be realized that these films have their own good and bad points which must be taken into consideration.

For example, most plastic films build up static so badly and many of them have such sharp melting points that they cannot be used on conventional packaging machinery. It is a challenge to the packaging machinery manufacturer to perfect machinery to make it possible to use these films in spite of these difficulties.

Certain of the plastic films have characteristic odors that make them objectionable for some uses and some of the films lack the necessary physical characteristics. It is a challenge to improve these characteristics.

The user of the packaging material must cooperate with both the film manufacturer and the machinery manufacturer in order to take full advantage of the outstanding characteristics of some of the plastic films. Many of the difficulties will be hard to overcome but certainly should not be insurmountable.

Properties desired in films for packaging

It is difficult to classify films generally as good or bad for all uses. However, the good and bad properties of a film can be determined and these properties used to evaluate a film for a specific end use. Some of the properties that are of interest in film materials are as follows:

Toxicity—Films for use in contact with food should not cause dermatitis or systemic toxicity. Most of the resins used in films are satisfactory from this standpoint but modifying agents such as plasticizers, stabilizers, etc., must be carefully scrutinized by the film manufacturer before incorporation in the film.

Taste and odor—Mild tastes and odors may not be objectionable for some purposes, but for many packaging applications they are objectionable. A few of the plastic film materials have characteristic odors which limit their application for some purposes.

Strength characteristics—Good tensile and tearing strength are important in films for most packaging purposes. The relationship between these properties and actual field performance is not always clear, as elongation of the film contributes greatly to toughness. Puncture resistance is of importance for many applications.

Elongation—The toughness of a film is closely related to its elongation. The amount of elongation required of a film will depend to a great extent on the use made of the film and the type of machinery in which it is to be handled.

Plasticizer retention—It is necessary to add plasticizer to many resins to obtain flexible films, especially at low temperatures. The ideal film from this standpoint is

Many new and unfamiliar plastic films will soon be available for packaging uses. Many of the older films which have been out of the picture for the duration are coming back with new and improved characteristics. This article, by one of the country's outstanding authorities on the subject, is intended to bring packaging men up to date. It includes research data never before disclosed.

* Of the Quartermaster Corps; head of research project on plastic films at Brooklyn Polytechnic Institute sponsored by QMC and the National Research Council.

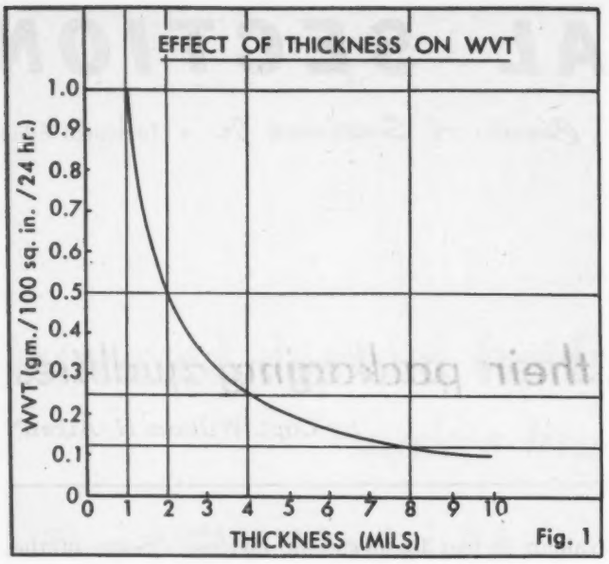


Fig. 1

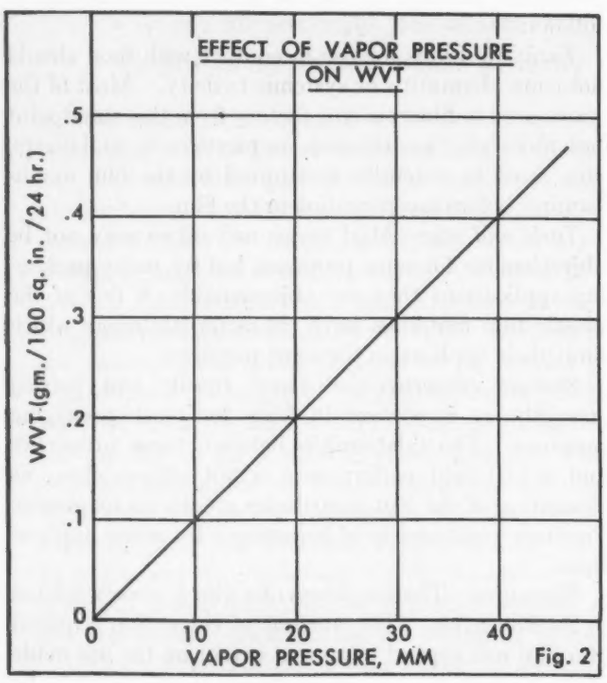


Fig. 2

one made from a resin requiring no plasticizer. If a plasticizer must be used, the efficiency of the ideal plasticizer will not be affected by relative humidity change and it will not be lost by volatilization, migration or leaching. Unfortunately, few plasticizers fulfill all these requirements.

Low-temperature characteristics — Low-temperature durability and flexibility are required of films for many packaging uses, especially in the packaging of frozen foods.

Blocking characteristics—A film which tends to cling or stick to itself at normal temperatures is undesirable. A film which has to be stored or shipped at high temperatures should be free of such blocking tendencies at the temperatures to which it is likely to be subjected.

Heat sealing—The ease of fabricating a film by heat-sealing is of importance in packaging applications, especially in view of the fact that other methods of fabrication are somewhat limited in application.

Surface characteristics—The surface frictional characteristics of film are important if the film is to be successfully run through automatic packaging machines.

Static accumulation—Films to be used on present-day automatic packaging machinery should be static-free. Unfortunately, most of the plastic films tend to accumulate static.

Transparency—This characteristic is important for many applications and is one of the primary reasons for using plastic films in packaging.

Greaseproofness—Resistance of the film to penetration by grease is of importance in many packaging applications.

Gas transmission—Resistance of the film to penetration by gases is of importance in many packaging applications.

Waterproofness—This property is required in most packaging applications.

Water-vaporproofness—In many packaging applications films with good water-vapor resistance are required. No plastic film has complete resistance to the passage of water vapor and each film varies in its resistance to passage of water vapor. The period of time for which protection is required must be taken into consideration in selecting a film as a water-vapor barrier.

General characteristics of film materials

Cellophane—Regenerated cellulose is the most widely used film material in the packaging field. While this material is not generally classed as a plastic, because of its wide usage, it forms a standard of comparison. It has excellent transparency and is inherently greaseproof and resistant to transmission of many gases. It is the lowest in price for a given area of all the transparent films. Cellophane can be coated to give heat-sealing and water-vapor-resistant properties. Some types of conventional packaging machinery tend to disturb the water-vapor-resistant coating and cause loss of water-vapor resistance. Recently developed Saran-coated cellophane seems to overcome this defect, although Saran-coated cellophane has not yet been successfully printed, and the Saran coating has a tendency to pick off on some types of heat-sealing equipment.

Cellophane is plasticized by hygroscopic materials such as glycerin or glycol which pick up water from the atmosphere, and most of the plasticizing action is due to this water. The water content of the film governs whether the film will be brittle or flexible. As the water content of the film is governed by the relative humidity of the air, the durability of the film, especially at low temperatures, will depend a great deal on the relative humidity at which the film is stored. Dimensions of cellophane also change with changes in relative humidity, so that this material cannot be used where very good dimensional stability is required.

Cellulose acetate—Cellulose acetate film is not inherently water-vapor resistant but has been used extensively as a laminant to aluminum foil to give toughness to the foil. It has been successfully used for windows in display boxes and as tight wraps where dimensional stability is required. Dimensions of cellulose acetate are not so stable with changes in relative humidity as are some of the more hydrophobic plastic films, but its dimensions remain sufficiently constant for it to be satisfactory for most applications.

Ethyl-cellulose—Ethyl-cellulose film has much the same characteristics as cellulose-acetate film with the possible exception of greater toughness at low temperatures. It has not been used extensively as a film material, probably because of its higher price and limited availability in this gauge.

Cellulose nitrate—This material has not been used as a thin unsupported film because of its high flammability. It could possibly be used as a laminating film if proper fire precautions were taken. The resistance of transparent cellulose nitrate to sunlight is rather poor and the film becomes discolored and brittle upon prolonged exposure.

Pliofilm—This film, prepared from rubber hydrochloride, has inherently good moisture-vapor resistance and can be readily heat sealed. It has been used extensively as a water-vapor barrier and during the war was used in laminated form for packaging airplane motors by Method II, despite the fact that the rubber supply was very critical. Pliofilm has a slight characteristic odor which is objectionable for some applications. Poor sunlight-aging characteristics and poor low-temperature characteristics limit its use.

Saran—This film, made from polyvinylidene chloride, is the most resistant to passage of water vapor of all transparent films. The film is difficult to heat seal by conventional methods, but special methods have been devised which make it possible to use it to a limited extent. The film carries on its surface a plasticizer with a characteristic odor and greasy feel, which limits its use for many applications. Because of the inherently very superior water-vapor resistant characteristics of Saran, this film deserves a great deal of work both by film manufacturers and packaging machinery manufacturers to perfect it for wide-scale packaging applications.

Rubber—Rubber films in general have poor strength, poor sunlight-aging resistance and tend to deteriorate under action of oils and greases. Rubber-wax films overcome many of these difficulties and have found considerable use in food packaging. Cryovac is a rubber film developed for use in frozen food packaging. At low temperatures it has excellent water-vapor resistance and excellent flexibility.

Polyvinyl butyral—Plasticized polyvinyl butyral gives a soft, tacky film which is of limited interest in the packaging field. Unplasticized polyvinyl butyral could probably be used to replace cellulose acetate for many applications, but the cost of such a film would probably be prohibitive.

Polyvinyl chloride and *vinyl chloride copolymers*—Vinyl chloride type films with no plasticizer, or low plasticizer content, have been produced commercially only recently. They should be of interest for some of the packaging applications now using cellulose acetate, but the cost of vinyl film at the present time is greater than that of cellulose acetate. Plasticized vinyl chloride type film has good strength characteristics and excellent drape and flexibility. It was used during the war for expendable weapon covers, powder bags and other applications where a tough, waterproof film was required.

Polyethylene—Film from this resin is inherently water-vapor resistant. It can be heat sealed but has not been successfully run on conventional packaging machinery because of its sharp melting point and static accumulation. The film is hazy to translucent, depending on the thickness and method of preparation. The film tends to stiffen somewhat at low temperatures, but low-temperature durability is excellent even to below minus 50 deg. F. Polyethylene films have a very dry surface and there is no tendency toward blocking. The film contains no plasticizer and has excellent sunlight resistance. Resistance to gas penetration is poor. The film should be of interest in packaging where resistance to gas penetration is not necessary.

Nylon—This film has been made only experimentally in this country. It has good strength characteristics, is extremely tough, but is somewhat water sensitive. It also has poor water-vapor resistance.

Polyvinyl alcohol—Polyvinyl alcohol film is very tough under conditions of normal humidity, but, as it is

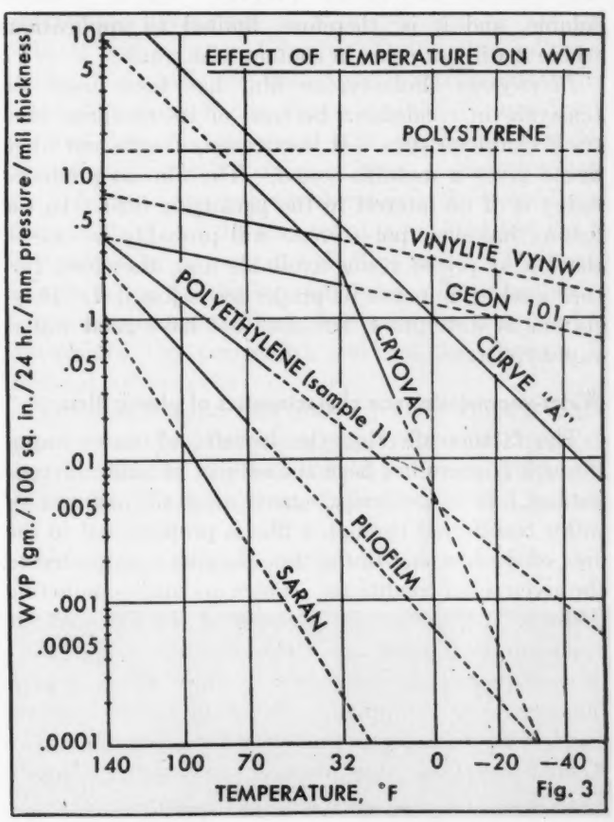


Fig. 3

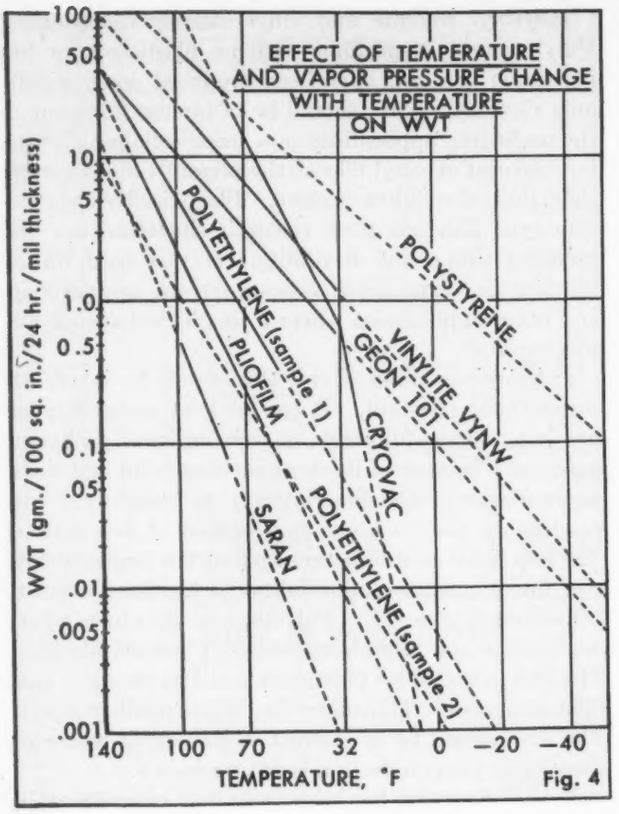


Fig. 4

plasticized with glycerin, this property depends a great deal on the relative humidity at which it is stored. It is inherently very resistant to the passage of grease, oils, solvents and gases. Polyvinyl alcohol is water soluble, and it is, therefore, limited to applications where it will not come in contact with water.

Polystyrene—Polystyrene film has been used extensively in condensers because of its excellent electrical characteristics. It is extremely fragile and when flexed gives a metallic sound. The film as produced today is of no interest in the packaging field. In the future, however, polystyrene will probably be one of the lowest priced resins available and, therefore, further work to improve its properties is justified. Polystyrene is waterproof, but does not have good water-vapor resistance.

Water-vapor-resistance characteristics of plastic films

The factors affecting the transfer of water vapor through barriers has been the subject of many investigations. It is generally agreed that the amount of water transferred through a film is proportional to the area of the film and to the time the film is subjected to the given set of conditions. There are many conflicting findings on the effect of thickness of the film and the vapor-pressure difference across the film. The effect of these factors on the transfer of water vapor through homogeneous, hydrophobic plastic films has been recently well defined and presented elsewhere (1, 2, 3).* Conclusions from this work are summarized briefly below. However, no attempt is made to discuss the factors affecting the water-vapor transfer rate of hydrophilic materials or non-homogeneous sheets (such as coated papers and cellophane), for the laws governing passage of water vapor through such materials are still not clear.

Effect of the thickness on water-vapor transfer rate—For homogeneous, hydrophobic plastic materials, the rate of water-vapor transfer through the film is inversely proportional to the thickness of the film, as shown by a typical curve in Fig. 1. It is seen that the plot of this relationship is a hyperbola. Since this relationship holds, doubling the thickness will halve the amount of water vapor going through a film; however, at higher thicknesses, the law of diminishing returns is soon reached and each additional mil of thickness gives only a small additional decrease in the actual amount of water-vapor transfer through the film.

Effect of vapor pressure difference across the film on water-vapor transfer rate—The water-vapor transfer rate for homogeneous, hydrophobic films is directly proportional to the vapor pressure difference across the film, as shown by a typical curve in Fig. 2. Since this relationship holds, doubling the vapor pressure across the film at any given temperature will double the amount of water-vapor transmitted through the film. It has been shown by many investigators that this relationship does not hold for hydrophilic plastics.

Effect of temperature on water-vapor transfer rate—Until recently, the effect of temperature on the water-vapor transfer rate was not clearly defined and this has led to many discrepancies in results obtained by different test methods operated at different temperatures. It has been recognized, of course, that temperature has an effect on the vapor pressure difference across the film. This effect is governed by the equation

$$\log p = \frac{KA}{T} + B$$

where p is the vapor pressure,
T is the absolute temperature,
K, A and B are constants.

Therefore, if p is plotted on a log scale against $1/T$, a straight line results. Curve A in Fig. 3 is such a plot, showing the change in vapor pressure brought about by change in temperature.

In addition to the effect of temperature on vapor pressure, changes in temperature also play a role in the inherent water-vapor transmitting characteristics of most films. This effect is governed by equation

$$P = P_0 e^{-E/RT}$$

where P = water-vapor transfer rate at a given temperature,
P_0 = water-vapor transfer rate at infinite temperature,
e = 2.718, the natural logarithm base,
E = energy of activation for permeation,
R = gas constant,
T = absolute temperature.

Therefore, if log P is (*Continued on page 172*)

* Numbers in parentheses refer to References appended.

Gas permeability . . . an isostatic test method

*by Donald W. Davis**

A new method and apparatus for determining the gas permeability of flexible packaging materials under isostatic conditions—i.e., involving no difference in total pressure across the sheet—are described. Several advantages are claimed for this method. Carbon dioxide and oxygen permeability values are given for a wide variety of sheet materials. Water-vapor permeabilities also can be determined by this method.

The need for information on the gas permeability of food packaging materials has been appreciated by many workers. Many foods are subject to deterioration through oxidation by atmospheric oxygen which may permeate into the package through the wrapper. Successful packaging of products in an inert atmosphere depends upon a package which will retain the inert gas and exclude atmospheric oxygen. In the packaging of cheese and coffee in hermetically sealed wrappers, provision must be made for the escape of the carbon dioxide which is evolved by these products. Such problems have made it desirable to have a method for determining the gas permeability of sheet materials.

Elder (1),† Schuman (2) and Todd (3) have described methods for determining the gas permeability of sheet materials based on the measurement of pressure or volume changes as the test gas permeates from the high-pressure to the low-pressure side of the sheet. These methods employ as much as one atmosphere difference in total pressure across the sheet. This necessitates rigid support of the test sheet with resultant close contact with the support, which tends to reduce and leave in doubt the effective test area. This factor has been noted previously by Morris and Street (4) in relation to their apparatus. Meticulous sealing of the test sheet is necessary to avoid the interpretation of small leaks as permeated test gas. Although these methods are undoubtedly very useful, it was thought desirable to have a test method which would avoid the above difficulties and would simulate most use conditions encountered in food packaging.

Smith and Kleiber (5) point out the desirability of testing under conditions involving no significant differences in total pressure and have described an apparatus for measuring the rate of penetration of oxygen from the air into pouches made of the test material. This method is not readily adapted, however, to the testing of flat sheets, is not applicable (as designed) to gases other than air, and does not provide for the control of relative humidity to which the test sheet is exposed. Edwards and Strohm (6) have recently described a gravimetric method for carbon dioxide permeability based on the cup or Vapometer can method commonly used for water-vapor permeability. This method avoids the use of sheet supports, but involves difficulties with total pressure differentials due to the sealed cups. The authors point out also the difficulty of maintaining known differences in partial pressure across the test sheet where there is no circulation of gas on the absorption side.

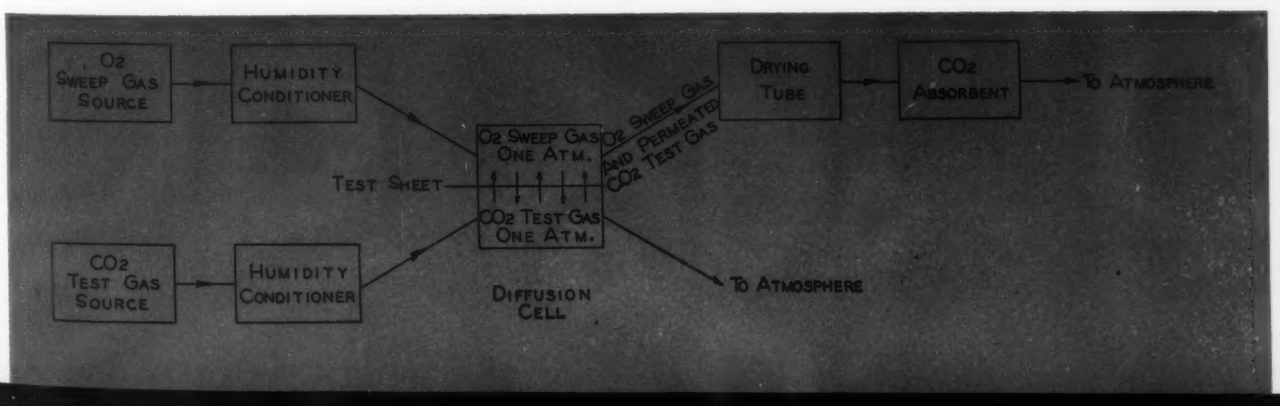
In an earlier paper, Edwards (7) described a "penetration" method for determining gas permeability which was claimed to be superior to the "volume loss" method both in precision and reliability. In his "penetration" method different gases, at approximately the same total pressure, are swept over the two sides of the test sheet and the amount of permeated test gas is determined by changes in refractive index of the opposite gas using the gas interferometer. The Cambridge fabric permeameter (8) employs a similar principle but determines the permeated test gas by changes in thermal conductivity.

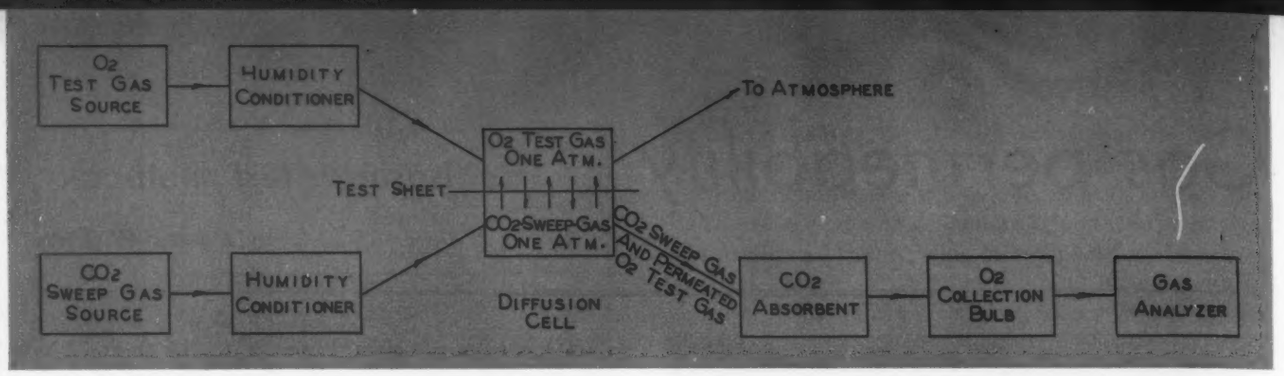
The present paper describes a method which is of the penetration type, but which employs chemical methods for determining the amount of permeated test gas. It has been designated an "isostatic" method because

* Director of Research, Converted Products Division, Marathon Corp., Menasha, Wis. Excerpts from a paper delivered at the Annual Meeting of the Technical Assn. of the Pulp and Paper Industry, Hotel Commodore, New York, Feb. 28, 1946.

† Numbers in parentheses refer to References appended.

1—*Schematic diagram illustrating isostatic method for determining the permeability to carbon dioxide.*





2—*Permeability test method for oxygen.*

the total gas pressures on the two sides of the test sheet are essentially equal (in contrast to "pressure" methods). By using different gases, both at atmospheric pressure, on the two sides of the sheet, the difference in *partial* pressure with respect to the test gas is about one atmosphere. This may give rise to a transmission of test gas through the sheet independently of differences in *total* pressure. The operation of Dalton's law of partial pressures in relation to gas transmission through packaging materials has been clarified by Elder (9). The condition of different partial pressures and equal total pressure on the two sides of the test sheet represents the usual conditions which are encountered with packages made from flexible sheet materials, except where vacuum packaging is used.

This method eliminates the need for rigid test sheet supports and avoids excessive stressing or compression of the sheets. With different gases on the two sides of the sheet, counter diffusion of the two gases takes place as with actual packages. In the ideal case gases will show their characteristic permeabilities toward a sheet material independently of the presence of other gases or vapors. However, there may be considerable divergence from this behavior in actual practice. It is recognized that, in general, the fixed gases show fairly independent behavior but numerous investigators have shown that the presence of vapors may markedly affect gas permeabilities. This is particularly true where the vapor has a solvent action or where it is strongly adsorbed by the sheet material.

The mechanism by which gases permeate through solids may be quite complex. It is generally recognized that two principal mechanisms are involved: (a) pore permeation, which is due to diffusion of the gas through small pores or orifices in the sheet material and (b) solution permeation, in which the gas dissolves in the sheet material, diffuses through the sheet and evaporates from the other side. Schuman (2) has elucidated the relationship of these two mechanisms to the conditions of the permeability method employed. The present method is designed primarily for determining solution type permeation. Although the method is essentially isostatic, involving no difference in total pressure across the sheet, it is feasible to operate the apparatus with the total pressure several millimeters of mercury higher on one side. In case pore type permeation is an appreciable factor with any sheet being tested, this will be shown by a large increase in permeation rate when the total pressure is slightly increased on the test gas side.

Principle of the isostatic method

The principle of this isostatic method is shown by reference to the schematic diagrams, Figs. 1 and 2. The test sheet is held to form the partition between two chambers of the diffusion cell. The test gas is passed over one side of the sheet and a second gas designated as the "sweep gas" is passed over the other side. Both gases are preconditioned to the relative humidity desired in the test. By continuous flowing of both gases over the surface of the sheet, stagnation is avoided, the permeated gases are swept out and the partial pressure of each gas on its own side is maintained at approximately one atmosphere. Any test gas which permeates the sheet is entrained by the sweep gas and is determined by appropriate means after exit from the diffusion cell. For carbon dioxide permeability (Fig. 1) oxygen may be used as the sweep gas and the permeated carbon dioxide entrained is determined gravimetrically by absorption in Ascarite (a sodium hydrate asbestos absorbent). For other test gases, such as oxygen or nitrogen or air (Fig. 2), carbon dioxide is used as the sweep gas which, on exit from the diffusion cell, is absorbed in potassium hydroxide solution. The permeated test gas which is thereby separated is collected and determined volumetrically in a gas analyzer. If desired, carbon dioxide and oxygen permeabilities may be determined simultaneously, in which case each gas serves as the sweep gas for the other.

Description of apparatus

The diffusion cell (Fig. 3) is designed to accommodate from one to 12 test sheets $6^1/_8$ in. in diameter, thereby giving a test sheet area of 29.5 to 354 sq. in., respectively. Where 12 sheets are used they are held between 13 copper rings which are assembled in a vertical stack. The top and bottom rings each are closed by a copper plate soldered to the face of the rings to form the end caps. The rings are numbered and marked to insure repeated assembly in the same relationship. Each ring has a copper tube soldered into opposite sides to serve as inlet and outlet to that chamber. The gas flow through each chamber sweeps across the surface of the test sheets which enclose it. The flow is distributed across the sheets by baffles soldered into

each ring. The stack of rings, with interleaved test sheets, is held tightly together by compression in a screw press. Gastight sealing of the test sheets is accomplished by means of a gasket, on each side of each sheet, cut from a .005-in. thick sheet of Parafilm (a rubber-wax composition). Alternate chambers are then connected in series by means of glass tubing and heavy wall rubber tubing to give a two-sided system with test gas on one side of the test sheets and sweep gas on the other. A manometer filled with mineral oil indicates the difference in total pressure between the two sides of the system. This assembly constitutes the diffusion cell.

The apparatus for determining carbon dioxide permeation rates is shown in Fig. 4.

For determining the permeation rates of oxygen, or nitrogen, or other gases for which rapid quantitative absorbents are not available, a volumetric method of analysis is used (Fig. 5).

Mounting test sheets

Representative samples are selected for testing and are carefully handled to avoid mechanical damage. The sheets are cut $7^1/_4$ in. square to give a minimum of $^1/_4$-in. extension beyond the edge of the diffusion cell rings. For high permeation rates, only one test sheet is used. For lower permeation rates, up to 12 test sheets may be used in the diffusion cell to increase the test area and to improve the sensitivity of the determination. If specific permeabilities are to be calculated, the average caliper of the sheets is determined.

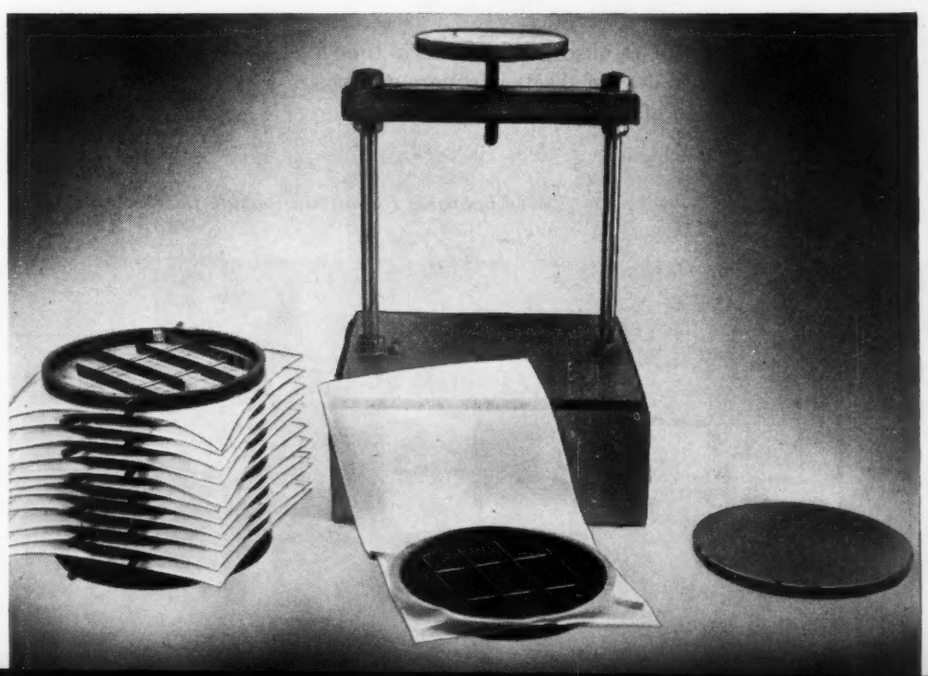
When all test sheets have been properly inserted between the diffusion cell rings, the assembled unit is compressed in the screw press to the maximum pressure obtainable with the 5-in. diameter knurled handle using hand leverage only. The Parafilm gaskets are sufficiently plastic under this pressure and at room temperature to flow slightly and in about one-half hour of such compression essentially gastight seals result. The assembly is then tested for leaks to the atmosphere by connecting the two sides of the system in series and applying about two inches of mercury pressure, as indicated by a manometer between the inside of the cell and the atmosphere. The cell should be tight enough to show no readable pressure loss in about 10 minutes.

After the diffusion cell has been loaded and checked for leaks it is connected to the test gas and sweep gas which have been conditioned to the desired relative humidity. Glass tubing is used, wherever possible, to connect the various parts of the apparatus. Butt junctions are made and joined with heavy wall gum rubber tubing to provide flexible connections. A minute amount of glycerin on rubber tubing connections is found to improve the tightness of the connection and it facilitates both making and breaking the union. The sweep gas flow rate is adjusted to 25 cc. per minute. This rate changes the gas in each chamber about every 10 minutes and serves to keep the partial pressure of the test gas on the sweep gas side of the sheet at a very low value. This rate is slow enough for quantitative absorption of the permeated test gas from the sweep gas. A test gas flow rate of 100 cc. per minute has generally been used in order to keep the partial pressure of the sweep gas on the test gas side of the sheet at a minimum value. These flow rates were found to be optimum with sheets of low permeability, but with sheets of very high permeability it may be necessary to increase both flow rates as required to maintain maximum partial pressure differentials.

The gases are allowed to flow through the diffusion cell at the above rates for at least two hours to allow equilibrium to become established before starting a test. With some types of sheets much longer flow time may be required to reach equilibrium.

Gravimetric method for carbon dioxide

For the determination of carbon dioxide permeability (Fig. 4) the exit sweep gas from the diffusion cell is first passed through a drying tube filled with Dehydrite. The dried sweep gas containing the permeated carbon dioxide is then passed successively through two Schwartz-type U-tubes filled with Ascarite. About $^1/_2$ in. of Dehydrite is used on top of the Ascarite in each leg of the U-tube and is held in place by a plug of glass wool. The second Ascarite



3—*Photographic view showing the partially assembled diffusion cell and press.*

tube is used only as a check on the first tube and it seldom shows any weight gain except with very high flow rates. A protection tube filled with Dehydrite is used at the end of the train, followed by a back pressure bottle containing water. The carbon dioxide test gas, on exit from the diffusion cell, is also vented to the atmosphere through a back pressure bottle, by means of which the difference in total pressure between the two sides of the system can be maintained at zero or any desired small value.

After the gas flows have been maintained at equilibrium conditions through the assembled apparatus for about 15 minutes the Schwartz tubes are disconnected and weighed to 0.1 mg. on an analytical balance. While the Schwartz tubes are disconnected from the apparatus the sweep gas outlet is connected directly to the back pressure bottle to avoid disturbance of the equilibrium conditions in the system. The weighed Schwartz tubes are then reconnected in the original manner and the gas flows are maintained for a sufficient length of time to give a readily weighable amount of carbon dioxide in the absorption tube. Triplicate determinations should be made. In cases where the permeability is so low that a readily weighable amount of carbon dioxide is not obtained in six or eight hours, the gas flows can be shut off by means of screw clamps at the inlets and outlets to the diffusion cell. The apparatus is then allowed to stand for 24–48 hours and at the end of the test period the gas flows are resumed at their original rate for a period of two or three hours to sweep out and absorb the permeated carbon dioxide which has accumulated on the sweep gas side of the system. Results are calculated according to the following equation:

$$\text{CO}_2 \text{ permeation rate} = \frac{w}{44} \times \frac{22{,}400}{a} \times \frac{24}{h} \times \frac{760}{(p + p_1 - p_2)}$$

$$= \frac{w}{ah(p + p_1 - p_2)} \times 9.3 \times 10^6$$

= cc. CO_2 (at 0° C. and 760 mm. Hg pressure) per square meter per 24 hours corrected to a difference in partial pressure of CO_2 across the sheet of 760 mm. Hg

where w = weight of CO_2 absorbed in grams in time h
a = total test area of sheets in square meters
h = duration of test in hours
p = barometric pressure in mm. Hg
p_1 = back pressure on test gas side of diffusion cell in mm. Hg
p_2 = partial pressure of water vapor in test gas in diffusion cell in mm. Hg

Volumetric method for oxygen

For the determination of oxygen permeability (Fig. 5) the diffusion cell is allowed to come to equilibrium as indicated above. The carbon dioxide sweep gas outlet from the diffusion cell is then connected directly to the gas inlet at the bottom of the carbon dioxide absorption tube containing 30% potassium hydroxide solution. The flow to the absorption tube is adjusted by means of a screw clamp so that the original sweep flow rate through flow meter is maintained and a constant stream of small gas bubbles is introduced into the bottom of the absorption tube. The carbon dioxide is almost completely absorbed in a travel of about 5 in. when the absorption tube contains fresh caustic solution. The need for fresh caustic solution in the system is indicated by an abnormally high rise of the carbon dioxide bubbles in the tube.

The sweep gas flow is continued for about 15 minutes to sweep out air entrapped in making the connection to the absorption tube. The gas flow is then discontinued by closing screw clamps. This time marks the end of the preparatory period and the beginning of the test determination. The level of the caustic solution in the collection bulb is then adjusted in the capillary outlet tube by opening the stopcock and manipulating the leveling bulb. The stopcock is then closed and the sweep flow is resumed by opening the screw clamps. The test is continued until an easily measurable amount of permeated oxygen has been accumulated in the collection bulb. The screw clamps are then closed and the accumulated oxygen is transferred to the gas burette through the stopcock and is mixed with about 25 cc. of oxygen-free nitrogen. The total volume is recorded, then the amount of oxygen present is determined by absorption in alkaline pyrogallol solution contained in the gas pipette. The oxygen permeation rate is calculated according to the following equation:

$$\text{Permeation rate} = (v - b) \times \frac{273}{t} \times \frac{(p - p_3)}{760} \times \frac{24}{ah} \times \frac{760}{(p + p_1 - p_2)}$$

4—Apparatus for carbon dioxide permeability test.

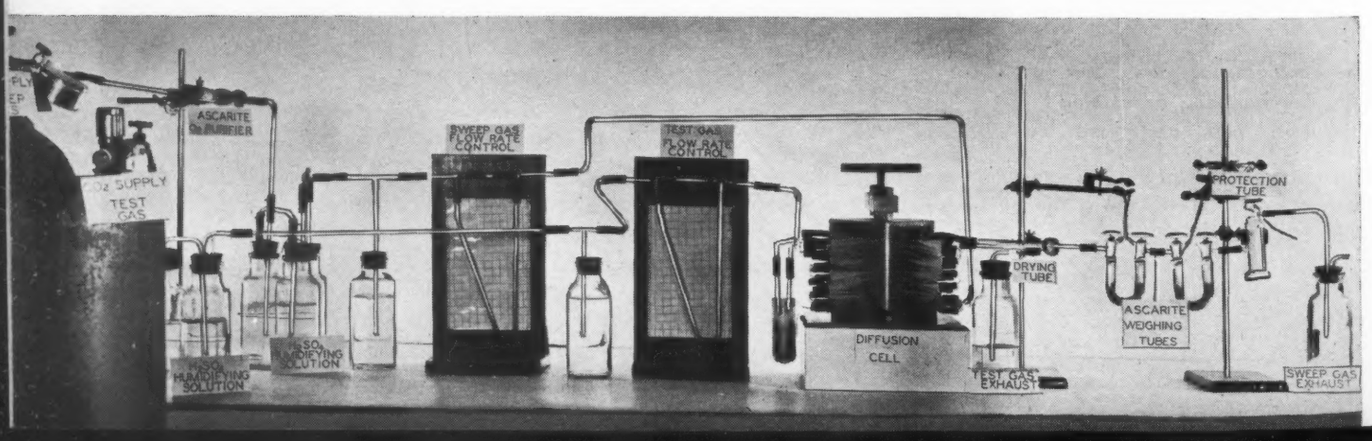


TABLE I—CARBON DIOXIDE AND OXYGEN PERMEABILITIES OF VARIOUS SHEET MATERIALS

Sample No.	Sheet material	Thickness, inches	Temperature, °C.	Relative humidity %	Permeation rate* in cc./sq. meter/24 hrs. Carbon dioxide	Oxygen	Specific permeability* in cc./sq. cm./min./cm. thickness Carbon dioxide	Oxygen
1	Cellophane, #300 PT (regenerated cellulose)	.0008	21	0	5	<1	$.0008 \times 10^{-6}$	$<.0002 \times 10^{-6}$
1	Cellophane, #300 PT (regenerated cellulose)	.0008	21	30	12	...	$.0017 \times 10^{-6}$	.....
1	Cellophane, #300 PT (regenerated cellulose)	.0008	21	75	99	49	$.014 \times 10^{-6}$	$.0069 \times 10^{-6}$
2	Cellophane, #300 MSAT (lacquered regenerated cellulose)	.0009	21	0	24	<1	.....	.....
3	Cellulose Acetate	.0009	21	0	17,000	2,300	2.7×10^{-6}	$.36 \times 10^{-6}$
3	Cellulose Acetate	.0009	21	75	14,000	1,200	2.3×10^{-6}	$.19 \times 10^{-6}$
4	Ethyl Cellulose	.0010	21	50	120,000	22,000	21.0×10^{-6}	3.8×10^{-6}
5	Koroseal (Polyvinyl chloride composition)	.0012	8	0	1,000	...	$.22 \times 10^{-6}$	.....
5	Koroseal (Polyvinyl chloride composition)	.0012	8	75	450	...	$.095 \times 10^{-6}$	.....
6	Koroseal (Polyvinyl chloride composition)	.0013	8	0	1,000	480	$.23 \times 10^{-6}$	$.11 \times 10^{-6}$
7	Koroseal (Polyvinyl chloride composition)	.0016	21	50	920	190	$.26 \times 10^{-6}$	$.055 \times 10^{-6}$
8	Vinylite (Polyvinyl chloride composition)	.0010	8	0	800	200	$.14 \times 10^{-6}$	$.036 \times 10^{-6}$
8	Vinylite (Polyvinyl chloride composition)	.0010	8	75	....	150	.....	$.027 \times 10^{-6}$
9	Saran (Polyvinylidene chloride composition)	.0013	21	50	14	4	$.0032 \times 10^{-6}$	$.0009 \times 10^{-6}$
10	Saran (Polyvinylidene chloride composition)	.0013	21	0	48	...	$.011 \times 10^{-6}$	.....
10	Saran (Polyvinylidene chloride composition)	.0013	8	0	33	33	$.0075 \times 10^{-6}$	$.0076 \times 10^{-6}$
10	Saran (Polyvinylidene chloride composition)	.0013	8	75	35	31	$.0081 \times 10^{-6}$	$.0072 \times 10^{-6}$
11	Nylon (Polyamide composition)	.0009	8	0	302	63	$.048 \times 10^{-6}$	$.010 \times 10^{-6}$
11	Nylon (Polyamide composition)	.0009	8	75	170	46	$.027 \times 10^{-6}$	$.0073 \times 10^{-6}$
12	Nylon (Polyamide composition)	.0018	21	50	170	29	$.054 \times 10^{-6}$	$.0091 \times 10^{-6}$
13	Parafilm (rubber-wax composition)	.0050	21	0	640	120	$.56 \times 10^{-6}$	$.11 \times 10^{-6}$
13	Parafilm (rubber-wax composition)	.0050	21	75	550	120	$.49 \times 10^{-6}$	$.11 \times 10^{-6}$
13	Parafilm (rubber-wax composition)	.0050	16	0	420	...	$.37 \times 10^{-6}$	.....
13	Parafilm (rubber-wax composition)	.0050	27	0	840	...	$.74 \times 10^{-6}$	.....
13	Parafilm (rubber-wax composition)	.0050	32	0	1,300	...	1.2×10^{-6}	.....
14	Pliofilm, tensilized (rubber hydrochloride)	.0004	8	0	1,000	240	$.069 \times 10^{-6}$	$.017 \times 10^{-6}$
14	Pliofilm, tensilized (rubber hydrochloride)	.0004	8	75	....	230	.....	$.016 \times 10^{-6}$
15	Pliofilm, tensilized (rubber hydrochloride)	.0006	21	0	1,500	...	$.16 \times 10^{-6}$	.....
16	Pliofilm, Grade NO	.0009	21	0	310	110	$.049 \times 10^{-6}$	$.017 \times 10^{-6}$
16	Pliofilm, Grade NO	.0009	21	75	.....	100	.....	$.016 \times 10^{-6}$
17	Pliofilm, Grade NO	.0013	21	0	1,500	...	$.34 \times 10^{-6}$	.....
18	Pliofilm, Grade P2	.0012	8	0	470	85	$.10 \times 10^{-6}$	$.018 \times 10^{-6}$
18	Pliofilm, Grade P2	.0012	8	75	320	66	$.068 \times 10^{-6}$	$.014 \times 10^{-6}$
19	Polyethylene	.0010	22	0	14,000	3,500	2.5×10^{-6}	$.62 \times 10^{-6}$
20	Polyethylene	.0030	22	0	610	1,000	3.2×10^{-6}	$.71 \times 10^{-6}$
21	Polystyrene	.0015	22	0	16,000	3,100	4.3×10^{-6}	$.81 \times 10^{-6}$
21	Polystyrene	.0015	22	75	....	3,200	.....	$.85 \times 10^{-6}$
22	Polyvinyl alcohol	.0008	21	50	380	310	$.053 \times 10^{-6}$	$.043 \times 10^{-6}$
23	Polyvinyl alcohol	.0010	8	0	<1	<1	$<.0002 \times 10^{-6}$	$<.0002 \times 10^{-6}$
23	Polyvinyl alcohol	.0010	8	75	627	18	$.11 \times 10^{-6}$	$.0031 \times 10^{-6}$
24	Polyvinyl butyral	.0042	21	0	16,000	2,300	12.0×10^{-6}	1.7×10^{-6}
24	Polyvinyl butyral	.0042	21	75	16,000	2,400	12.0×10^{-6}	1.8×10^{-6}
25	Rubber, vulcanized Dental Dam	.0087	21	0	45,000	...	69.0×10^{-6}	.....
26	Rubber, RCMA pale crepe cast from solvent	.0067	20	0	61,000	9,300	72.0×10^{-6}	11.0×10^{-6}
27	Butyl rubber cast from solvent	.0195	20	0	810	180	2.8×10^{-6}	$.62 \times 10^{-6}$
28	Vistanex (Polyisobutylene) cast from solvent	.0119	20	0	1,200	160	2.5×10^{-6}	$.34 \times 10^{-6}$
29	Greaseproof paper, 30 lb. (24 × 36—480)	.0022	27	75	3,100	1,800	1.2×10^{-6}	$.72 \times 10^{-6}$
30	Glassine, 25 lb. (24 × 36—480)	.0012	21	0	570	660	$.12 \times 10^{-6}$	$.14 \times 10^{-6}$
30	Glassine, 25 lb. (24 × 36—480)	.0012	21	75	610	320	$.13 \times 10^{-6}$	$.067 \times 10^{-6}$
31	Glassine, 25 lb. (24 × 36—480)	.0013	21	0	14,000	17,000	3.3×10^{-6}	4.0×10^{-6}
31	Glassine, 25 lb. (24 × 36—480)	.0013	21	75	12,000	14,000	2.8×10^{-6}	3.3×10^{-6}

*Corrected to 760 mm. Hg difference in partial pressure of test gas across test sheet.

TABLE II—GAS PER

Sample No.	Sheet
32	Sulphite paper, 23 lb. calendered
32	Sulphite paper, 23 lb. calendered
32	Sulphite paper, 23 lb. calendered
33	Sulphite paper (dup coated one side wit
33	Sulphite paper (dup coated one side wit
34	Vegetable Parchment Lard Liner
34	Vegetable Parchment Lard Liner
34	Vegetable Parchment Lard Liner
35	Aluminum foil
35	Aluminum foil
35	Aluminum foil
36	Aluminum foil
36	Aluminum foil
36	Aluminum foil
36	Aluminum foil
37	Aluminum foil
37	Aluminum foil
38	Aluminum foil (duplic
39	Aluminum foil (dup laminated to Kraf 25 lb. of wax (24 ×

*Corrected to 760 mm. Hg differ

TA

Sample No.	Sh
1	Cellophane,
1	Cellophane,
3	Cellulose Ace
3	Cellulose Ace
13	Parafilm (rub
16	Pliofilm, Gra

*Corrected to 760 mm. Hg differ

TABLE II—GAS PERMEATION RATES OF SHEET MATERIALS EXHIBITING VARIABLE PORE-TYPE PERMEATION

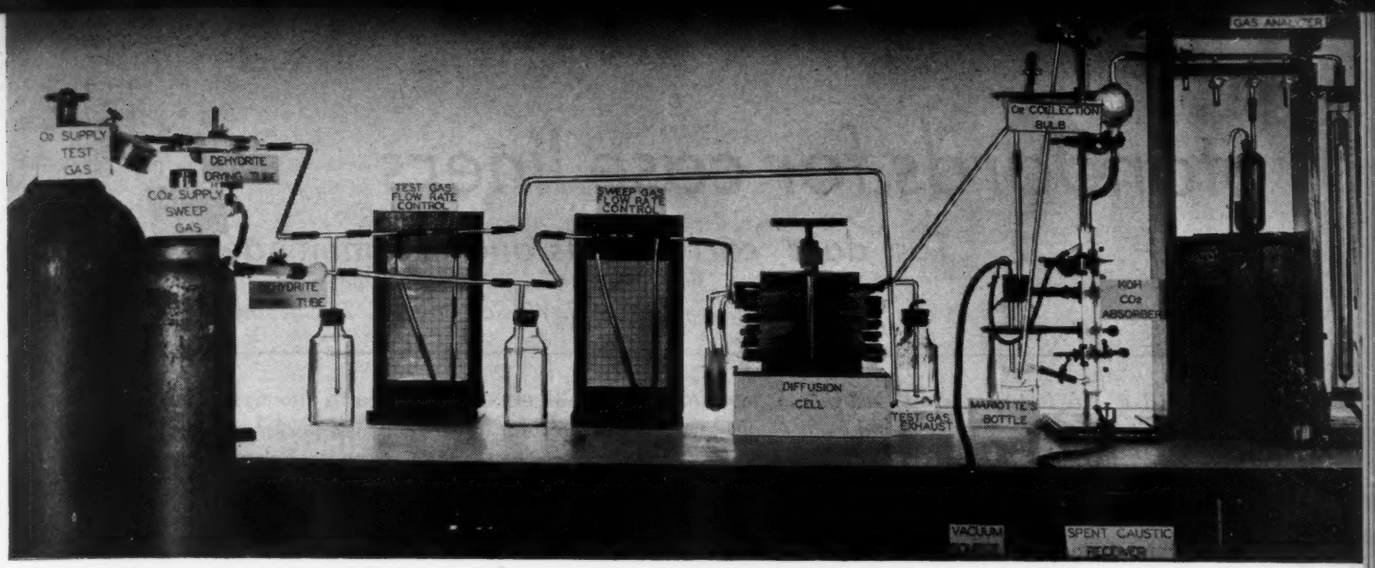
Sample No.	*Sheet material*	*Thickness, inches*	*Temperature, ° C.*	*Relative humidity %*	*Difference in total pressure, inches mineral oil*	*Side with higher pressure*	*Permeation rate* in cc./sq. meter/24 hrs. Carbon dioxide*	*Oxygen*
32	Sulphite paper, 23 lb. (24 × 36—480) supercalendered	.0018	26	75	0.0	.....	130,000	....
32	Sulphite paper, 23 lb. (24 × 36—480) supercalendered	.0018	22	0	0.0	.....	120,000	....
32	Sulphite paper, 23 lb. (24 × 36—480) supercalendered	.0018	22	0	0.5	Test gas	250,000	....
33	Sulphite paper (duplicate of Sample 32) coated one side with 28 lb. of paraffin wax	...	26	0	0.0	.....	39	....
33	Sulphite paper (duplicate of Sample 32) coated one side with 28 lb. of paraffin wax	...	26	0	0.5	Test gas	38	....
34	Vegetable Parchment, 35 lb. (24 × 36—480) Lard Liner	.0024	21	0	0.0	.....	22,000	31,000
34	Vegetable Parchment, 35 lb. (24 × 36—480) Lard Liner	.0024	21	0	1.0	Test gas	170,000	170,000
34	Vegetable Parchment, 35 lb. (24 × 36—480) Lard Liner	.0024	21	0	1.0	Sweep gas	8,000	5,200
35	Aluminum foil	.0010	22	75	0.0	.....	79	....
35	Aluminum foil	.0010	22	75	0.1	Sweep gas	....	91
35	Aluminum foil	.0010	22	75	0.6	Sweep gas	....	91
36	Aluminum foil	.0007	22	0	0.3	Sweep gas	1,700	....
36	Aluminum foil	.0007	22	0	0.2	Test gas	1,600	....
36	Aluminum foil	.0007	22	75	0.2	Sweep gas	1,400	....
36	Aluminum foil	.0007	22	75	0.9	Test gas	1,500	....
36	Aluminum foil	.0007	22	75	0.0	.....	....	1,500
36	Aluminum foil	.0007	22	75	0.8	Test gas	....	1,500
37	Aluminum foil	.0005	21	75	0.0	.....	10,000	....
37	Aluminum foil	.0005	21	75	0.6	Test gas	37,000	....
38	Aluminum foil (duplicate of Sample 37)	.0005	21	75	0.0	.....	1,400	....
39	Aluminum foil (duplicate of Sample 37) laminated to Kraft paper, 25 lb., with 25 lb. of wax (24 × 36—480)	...	21	75	0.0	.....	8	....

*Corrected to 760 mm. Hg difference in partial pressure of test gas across test sheet.

TABLE III—NITROGEN PERMEABILITY OF VARIOUS SHEET MATERIALS

Sample No.	*Sheet material*	*Thickness, inches*	*Temperature, ° C.*	*Relative humidity, %*	*Permeation rate* in cc./sq. meter/24 hrs.*	*Specific permeability* in cc./sq. cm./min./cm. thickness*
1	Cellophane, #300 PT	.0008	21	0	<1	$< .0002 \times 10^{-6}$
1	Cellophane, #300 PT	.0008	21	75	7	$.0010 \times 10^{-6}$
3	Cellulose Acetate	.0009	21	0	420	$.066 \times 10^{-6}$
3	Cellulose Acetate	.0009	21	75	320	$.051 \times 10^{-6}$
13	Parafilm (rubber-wax composition)	.0050	21	75	97	$.087 \times 10^{-6}$
16	Pliofilm, Grade NO	.0009	21	75	32	$.0051 \times 10^{-6}$

*Corrected to 760 mm. Hg difference in partial pressure of nitrogen across test sheet.



5—*Apparatus as set up for oxygen permeability test.*

$$= \frac{(v-b)(p-p_3)}{ahl(p+p_1-p_2)} \times 6.5 \times 10^3$$

= cc. test gas (at 0° C. and 760 mm. Hg pressure) per square meter per 24 hours corrected to a difference in partial pressure of test gas across the sheet of 760 mm. Hg

where v = volume of test gas collected in cc.
b = volume of test gas in cc. from a parallel blank determination
a = area of test sheets in square meters
h = duration of determination in hours
t = temperature in degrees Absolute at which volume v was measured
p = barometric pressure in mm. Hg
p_1 = back pressure on test gas side of diffusion cell in mm. Hg
p_2 = partial pressure of water vapor in test gas in diffusion cell in mm. Hg
p_3 = partial pressure of water vapor in mm. Hg in gas volume v when measured. (This is the pressure of water vapor from the 30% potassium hydroxide solution and the alkaline pyrogallol solution. These values are approximately equal and are taken to be 13 mm. Hg at 21° C.)

This equation is used also in calculating the permeation rate of other gases which are determined by the volumetric method.

Permeabilities as calculated by the above formulas are corrected from the conditions actually used, to rates which would be obtained at a difference in partial pressure of test gas across the test sheet of 760 mm. Hg, on the assumption that permeation rates are directly proportional to partial pressure difference, in accordance with Fick's law. Specific permeability can be calculated from the above permeation rates by means of the following equation:

$$\text{Specific Permeability} = \text{Permeation Rate} \times \text{Sheet Thickness} \times 0.176 \times 10^{-6}$$

in cc./sq. cm./min./ cm. thickness	in cc./sq. meter/ 24 hrs.	in inches

In the determination of very low permeabilities the precision of the results is improved by making a blank determination under conditions paralleling those of the test, and subtracting the blank from the test value. Blank determinations are made under the same conditions as the test except that the sweep gas is passed through both sides of the system.

Results

The present investigation has been confined largely to the determination of carbon dioxide and oxygen permeabilities because of the greater interest in these gases in connection with food packaging. Nitrogen permeability was determined on a few sheets. The permeabilities found for a wide variety of sheet materials to carbon dioxide and oxygen at various temperatures and relative humidities are given in Table I. Different samples of the same sheet material may show wide variations in permeability. For this reason, comparisons to show the effect of any variable on permeability should not be made except where the determinations were made on the same sample.

Results show that varying the relative humidity between 0% and 75% has little or no effect on the gas permeability of such non-moisture sensitive sheets as Saran, polystyrene and polyvinyl butyral. With other materials which are also relatively non-moisture sensitive, such as cellulose acetate, Koroseal, Nylon and Pliofilm, the gas permeability tends to decrease as the relative humidity is increased. Extremely moisture-sensitive sheets such as PT cellophane and polyvinyl alcohol show tremendous increases in the permeability to carbon dioxide and oxygen as the relative humidity is increased from 0% to 75%. However, in the case of glassine, which is also moisture sensitive, it was found that increasing the relative humidity had a tendency to reduce the permeability to carbon dioxide and oxygen. The effect of temp- (*Continued on page 176*)

Standards for case liners

2. Test data, correlations and recommended standards

*by B. W. Scribner, F. T. Carson and C. G. Weber**

(Article 1 of this two-part series, last month, described preparations, materials, equipment and methods of testing for the development of improved specifications for shipping-case liners. Results of tests and recommended standards of significant properties for use in purchase specifications are given herewith.)

The test data for the physical properties of the case-lining materials, with the exception of moisture resistance, and for acidity are given in Tables I and III. The weight of asphalt is based on information received from the manufacturers, as satisfactory test data could not be obtained. The test for acidity was made because it was thought that the heat of the laminating process might cause deterioration of the materials if the acidity were too high. However, with only a few exceptions, the pH of the materials was 5.0 or more, which indicates acidity that would not be harmful.

The test data for the resistance of the materials to water and water vapor are given in Tables II and IV.

Table V shows the results of the bleeding tests.

Correlation of test data

Determination of the significance of test data is necessary in arriving at a quality standard for any material. In the present instance, judgment of performance was based on results of the tests of the packed shipping cases at the Package Research Laboratory.[1, 2, 3, 4] There the different materials were given ratings based on how well they survived the simulated service tests. The rating was made by a system of scoring with respect to the occurrence of holes and tears. A score of 6 was the maximum, indicating fewest failures; a score of 0 indicated the poorest performance. Case liners A, C, K, W and Z were given a score of 6; liners V and CC, a score of 5; and liners H, O, T, U, DD and EE, a score of 4. These three scores were characterized as indicating satisfactory performance. The remaining case liners, which received scores of 2, 1 and 0, were classed as unsatisfactory.[4]

A slightly different method of rating the case liners is shown in Table VI. This rating is based on the same data used in the above classification, with the addition of Columns 7 and 8 of the table, but was arrived at by a different method of handling the data. In Table VI the liners are arranged in the eight numbered columns according to excellence of performance in the simulated service tests made at the Package Research Laboratory. The composite-rating value of each liner, shown in the last column, is the sum of the 8 position numbers of the liner in the 8 numbered columns. The first 13 liners in Table VI are the same 13 liners that were classified independently as satisfactory by the score method referred to above, but the order within both the "satisfactory" group and the "unsatisfactory" group is somewhat different. In the subsequent discussion the "satisfactory" group, which includes the same liners by either method of classification, will be called Group I; the "unsatisfactory" liners will be called Group II.

In Table VII the case liners are listed in the order of performance according to the composite rating of Table VII, and the corresponding physical properties, determined by tests made at the National Bureau of Standards, are tabulated. The data given are averages of the values in the machine direction and in the cross direction, or averages of values for the two sides of the liners (according to the nature of the tests), obtained from Tables I to IV. There is one exception: the Taber abrasion value given for each liner is the minimum value obtained on the two sides of the liner.

Since the performance rating, by either method, is based largely on the development of holes and tears during the simulated service tests, the correlation of the simulated service tests with the physical properties of the liner material must logically be a correlation with the results of those tests of physical properties which apply stresses intended to produce some form of failure by rupture or wear. That there is some such correlation is indicated by the fact that it is possible to choose a combination of tests and limits of test values that will separate completely Group I from Group II. For example, a puncture resistance (Beach) of not less than 40 units; a tensile strength of not less than 30 lbs./in.; a stretch of not less than 5%; and a tearing resistance of not less than 355 g. will do this. All liners in Group I will be retained under this combination of physical-property requirements. All but 7 liners in Group II will be eliminated by the first requirement; 3 of these 7 will be eliminated by the second requirement; 2 of the remaining 4, by the third requirement; and the remaining 2, by the fourth requirement.

Of course, such a procedure is an elastic and arbitrary one, in that some other combination could be found that would divide the liners at a different level. It is apparent, however, that a reasonable specification of physical properties might be drawn up that would retain un-

* All of the National Bureau of Standards, U. S. Dept. of Commerce, Washington, D. C.

[1] H. A. Wolsdorf and E. G. Mullen, MODERN PACKAGING, *18*, No. 9, 131 (May 1945).
[2] H. A. Wolsdorf, *Paper Trade J.*, *121*, No. 4, 46 (July 26, 1945).
[3] E. R. Stivers, *Paper Trade J.*, *121*, No. 4, 47 (July 26, 1945).
[4] H. A. Wolsdorf and E. G. Mullen, MODERN PACKAGING, *19*, No. 4, 154 (Dec. 1945).

TABLE I—PHYSICAL PROPERTIES AND ACIDITY OF ASPHALT-LAMINATED KRAFT PAPERS

Sample designation	*Special treatments*[1]	*Weight, 3,000 sq. ft.*		*Bursting strength*	*Puncture resistance*		*Tearing*[3] *resistance*		*Tensile strength*		*Tensile strength retained when wet*		*Stretch*		*Stiffness*		*Resistance to scuffing*				*Acidity, hot extraction*
																	N.B.S. wet rub		*Taber dry rub*		
		Total	*Asphalt*		*M.D.*[2]	*C.D.*[2]	*M.D.*	*C.D.*	*M.D.*	*C.D.*	*M.D.*	*C.D.*	*M.D.*	*C.D.*	*M.D.*	*C.D.*	*M.D.*	*C.D.*	*Inside*[4]	*Outside*[4]	
		lbs.	*lbs.*	*points*	*points*	*points*	*g.*	*g.*	*lbs./in.*	*lbs./in.*	*%*	*%*	*%*	*%*	*g.*	*g.*	*double rubs*	*double rubs*	*rev./cg.*	*rev./cg.*	*pH*
Duplex, Uncreped																					
M	W_1	174	75	110	28	28	380	470	88.8	47.2	12	13	2	5	930	570	540	470	10	12	5.7
D	I_1	212	90	112	35	36	470	480	85.8	56.6	13	14	2	6	1,200	840	1,000	810	10	42	7.0
J	I_1	165	65	100	25	26	380	440	75.6	50.7	9	9	3	5	910	630	780	790	11	40	5.8
S	I_1	193	90	108	23	23	330	340	72.5	40.2	18	20	3	6	810	450	850	680	8	59	6.6
F	R	214	135	103	43	49	...	...	71.4	41.8	24	23	2	4	850	550	380	370	11	14	6.6
G	R	175	95	72	29	30	...	...	67.0	34.2	31	27	2	5	560	320	230	200	26	14	5.2
Duplex, Creped																					
V		214	115	57	81	48	310	400	29.7	30.3	22	19	23	7	200–	450	220	260	15	19	6.2
HH		243	155	61	73	49	320	380	28.3	37.8	22	26	15	5	200–	730	460	680	6	33	4.1
GG	W_1	193	95	88	30	27	330	380	39.5	31.6	31	28	6	6	260	420	310	430	5	11	5.9
K	I_1	314	180	110	54	52	500	630	53.0	44.2	26	23	13	7	640	1,100	1,000	1,200	24	48	4.7
T	I_1	245	115	110	45	35	420	450	41.4	52.6	30	35	16	6	250	850	350	420	8	130	5.8
BB	WS_1, W_1	199	110	69	63	39	320	340	29.1	39.0	29	24	18	5	200–	680	610	580	9	21	4.4
C	R	320	180	110	67	73	...	...	36.6	46.6	36	36	14	5	420	1,000	750	920	14	13	6.0
U	R, WS_2	262	155	104	53	54	...	...	42.0	42.0	55	57	5	4	590	860	1,600	2,400	30	48	5.7
EE	R, WS_2	274	160	116	59	65	...	...	39.0	60.0	56	45	17	5	590	1,100	2,300	2,100	24	50	6.8
Triplex, Creped																					
One Sheet Creped																					
E		228	140	71	30	30	350	460	67.4	36.2	12	11	2	8	720	570	530	490	19	21	6.9
AA	MR_1	262	170	77	32	32	450	490	57.3	37.5	26	19	3	5	620	560	920	880	10	9	5.2
CC	I_1	307	175	88	44	46	470	610	69.6	43.6	27	29	3	8	790	900	1,200	850	17	100	5.7
Two Sheets Creped																					
B	I_2	270	130	88	34	35	370	460	44.2	34.2	38	28	5	9	350	500	590	610	143	67	6.1
Three Sheets Creped																					
A		567	430	80	237	127	600	830	34.2	26.0	51	47	26	25	430	560	2,700	3,000	67	42	7.8
H		363	180	95	45	42	480	470	32.0	47.8	25	27	22	7	520	890	1,200	1,100	24	22	7.6
O	WS_2	418	275	117	313	143	1,100	920	54.5	55.7	45	49	33	12	660	1,300	600	620	23	22	6.8
DD	WS_2, W_1	427	280	98	316	184	790	900	50.7	50.3	39	43	24	7	580	1,000	360	320	16	42	5.7
W	I_3	300	150	124	53	52	560	720	52.2	49.7	36	40	12	8	440	1,200	580	590	56	48	6.0

[1] W—Waxed, I—Infused with asphalt, R—Reinforced with strands or cords of fibres, WS—Treated with melamine resin for high wet strength, MR—Treated for mold resistance. The numbers are the number of sheets treated.
[2] M.D.—Machine direction, C.D.—Cross direction.
[3] Test for tearing resistance could not be made because of interference of the reinforcing materials.
[4] Inside and outside indicate the positions of the sides of the paper in the case liner made from it. Physcial tests made at 50% relative humidity and 73 deg. F.

equivocally most of the satisfactory liners, while eliminating equally unequivocally most of the unsatisfactory liners. The few liners that are a little difficult to place definitely in one group or the other, by their physical properties, are naturally those near the division line of Table VII, between Groups I and II.

For example, Liner R performed very well in the simulated service tests, while under tropical conditions, but performed poorly under arctic conditions. To make such a distinction by physical properties alone would require that certain tests to failure be made on the liner materials at a low temperature, under which condition the asphalt becomes brittle, but no such tests were made at the National Bureau of Standards. It is observed, however, that all the liners of this construction (P, Q and R) are weak in tension under normal conditions, which provides a means of eliminating them by a tensile requirement.

Then there are some liners above and below the division line that did not differ much in performance in the simulated service tests, when ranked according to Table VI. Liners V, HH and GG are similar in structure, and are comparable to one another in most physical properties. The propriety of regarding one of these as satisfactory and the other two as unsatisfactory may reasonably be questioned.

The physical properties tabulated in Table VII are useful in varying degrees in separating the two groups. All liners of Group I (first 13 in Table VII) have a puncture resistance (Beach) of 40 units or more; only 5 (tests of R and Q not having been made) in Group II exceed this value. Of the liners in Group I on which tests of tearing resistance could be made, all but one tested 435 g. or more; only 4 of those in Group II exceeded this figure. Although tearing resistance is useful as far as it goes, satisfactory tests cannot be made on many liners containing cloth, strands or long fibrous material. For this reason it is not very desirable to use tearing resistance in a specification if it can be avoided.

A bursting strength (Mullen) of 80 points or more was found for all liners in Group I, with one exception; but two-thirds of the liners in Group II also have bursting strength values above this figure. Bursting strength, therefore, is not very useful in separating the two groups. Likewise, the range of tensile-strength values is so much alike in the two groups that this property might be dismissed as of little value, except for one consideration. As previously stated, the liners P, Q and R, made of cellulose wadding infused with asphalt, were classed as unsatisfactory because of their very poor performance under arctic conditions. The only physical test made at normal temperature that will eliminate these liners is tensile strength, and this fact appears to be the only logical reason for including the tensile test in the effort to separate Group I and Group II by their physical properties alone. The tensile strength of the liners when wet is, on the other hand, more useful. All but 3 of the satisfactory group have a wet-tensile strength of 15 lbs./in. or more; only 3 of the unsatisfactory group exceed this figure. Stretch is also useful. Only 2 of the liners in Group I have a stretch of less than 10%; about two-thirds of the liners in Group II have a stretch of less than 10%.

Stiffness apparently has no bearing on the separation of the two groups. This might be expected, since a test of stiffness does not involve rupture or wear.

It was expected that the "wet-rub" test would be related to the separation of the two groups, inasmuch as the scuffing of the wet liners, and the wearing of holes through them, are the very essence of some of the simulated service tests. It is apparent, however, from the data in Table VII that the corresponding test on the liner materials has little relation to the separation of the two groups. The Taber abrasion test on the dry surface does, on the contrary, appear to help in the classification, provided that the minimum value for the two sides is used. All but 2 of the satisfactory liners have a minimum Taber value of 15 or more revolutions per centigram of material worn away; only 2 of the unsatisfactory liners have a minimum Taber value exceeding this figure.

Resistance to the transfer of moisture through the liners, although it probably had no direct bearing on the simulated service tests, is of primary importance in its own right, since the chief function of a case liner is to serve as a moisture barrier. A liner may withstand all necessary rough treatment without injury, and still be inherently unable to protect the contents of a shipping case against damage by moisture. The values for water resistance and for water-vapor permeability are given in Table VII. Very few liners in either group (but some in both) have a water-resistance value less than 20 hours. The water-vapor permeability is the only test listed for which the degree of excellence is considered as inversely related to the numerical value given. In Group I, all but 2 liners have a water-vapor permeability of 19 g./m.²/d. or less at 100 deg. F. and 90% relative humidity; in Group II the liners were equally divided on each side of this figure.

The following combination of physical tests and limiting values seems to provide a reasonable basis for selecting satisfactory case liners:

Puncture resistance (Beach), average of both directions, not less than 40 units.

Tensile strength, average of both directions, not less than 30 lbs./in. width.

Wet-tensile strength, average of both directions, not less than 10 lbs./in. width.

Stretch, average of both directions, not less than 8%.

Water resistance, on creases made at 40 deg F., average of both sides, not less than 20 hours.

Water-vapor permeability at 100 deg. F. and 90% relative humidity, on creases made at 40 deg. F., not more than 20 grams per square meter per 24 hours.

(EDITOR'S NOTE: Some authorities will question the desirability of water-vapor impermeability in this degree, and the arbitrary elimination of certain liners on this score alone appears open to challenge. According to one school of thought, it is desirable that a shipping-case liner, while impermeable to water, be relatively permeable

TABLE II—RESISTANCE OF ASPHALT-LAMINATED CASE-LINING PAPERS TO WATER AND WATER VAPOR

Sample designation	Notes[1]	Water resistance, hrs. —73° F.—50% R.H.— Side[2] 1 Uncreased	Side 1 Creased	Side 2 Uncreased	Side 2 Creased	Water vapor permeability, g./m.²/24 hrs. —73° F.—50% R.H.— Side 1 Uncreased	Side 1 Creased	Side 2 Uncreased	Side 2 Creased	—100° F.—90% R.H.— Side 1 Uncreased	Side 1 Creased	Side 2 Uncreased	Side 2 Creased
Duplex, Uncreped													
M	W_1	78	55	64–100+	80–100+	2.2	2.8	2.2	5.3	18.0	25.6	19.7	39.1
D	I_1	100+[3]	18	100+	7	1.3	10.9	1.5	3.3	9.9	60.1	10.2	18.1
J	I_1	90–100+	84	100+	76–100+	2.7	5.3	2.4	7.7	22.2	61.1	18.5	88.1
S	I_1	92–100+	21	97	57	1.8	2.5	1.7	2.8	17.3	20.2	16.7	19.3
F	R	25	19	29	15	1.9	3.8	1.6	3.0	15.2	31.3	13.1	23.8
G	R	51	13	52	9	1.9	5.7	2.0	6.8	18.6	39.2	20.2	45.8
Duplex, Creped													
V		20	16	19	14	2.0	2.1	1.9	2.1	18.3	17.2	14.9	18.0
HH		33	39	27	42	1.6	1.7	1.6	1.7	13.1	13.3	12.8	13.6
GG	W_1	43	43	48	45	1.8	1.8	1.5	1.7	16.4	15.3	13.6	14.7
K	I_1	100+	62–100+	70–100+	38	1.1	1.2	1.1	1.1	9.9	10.3	10.7	8.9
T	I_1	60	44	49	47	2.0	3.8	1.7	3.8	30.0	45.8	23.0	48.1
BB	WS_1, W_1	36	25	33	21	2.8	3.0	2.4	2.6	34.0	29.8	23.9	23.9
C	R	20	28	29	23	1.2	1.3	1.1	1.1	13.4	14.7	12.8	12.8
U	R, WS_2	47	32	41	26	1.2	1.8	1.3	2.2	11.5	13.9	12.5	17.9
EE	R, WS_2	41	30	25	31	1.3	1.5	1.2	2.3	12.7	14.0	11.4	19.2
Triplex, Creped													
One Sheet Creped													
E		100+	92–100+	100+	100+	1.3	1.7	1.2	1.8	9.5	13.6	8.4	14.5
AA	MR_1	88–100+	100+	100+	100+	0.9	0.9	0.8	1.0	7.2	7.3	6.7	7.5
CC	I_1	100+	66	100+	100+	0.7	1.6	0.7	1.6	5.5	7.6	5.0	6.6
Two Sheets Creped													
B	I_2	64	57	57	63	1.3	1.5	1.1	1.6	10.7	13.5	9.4	14.9
Three Sheets Creped													
A		100+	100+	100+	100+	0.3	0.4	0.3	0.3	2.6	2.8	2.6	2.6
H		68	43–100+	69	91–100+	0.8	0.9	0.7	1.5	6.8	6.6	6.4	9.9
O	WS_2	96–100+	60	32–100+	60	0.7	1.7	1.1	0.9	7.0	23.6	13.4	9.2
DD	WS_2, W_1	88–100+	60	100+	98–100+	0.6	0.8	0.7	0.0	8.2	7.4	11.2	10.6
W	I_3	69	23	92	18	2.4	2.9	1.6	2.8	19.7	18.6	14.1	18.7

[1] See notes of Table I for explanation.
[2] Side 1 and Side 2 indicate the side exposed to water or water vapor. Side 1 is the outer side of the paper in the case liner made from it. In papers having one side infused with asphalt or other materials, it is the side so treated.
[3] All tests for water resistance discontinued at the end of 100 hours.

TABLE III—PHYSICAL PROPERTIES AND ACIDITY OF MISCELLANEOUS CASE-LINING

Weight, 3,000 sq. ft. Total	Asphalt	Bursting strength	Puncture resistance M.D.[1]	C.D.[1]	Tearing resistance M.D.	C.D.	Tensile strength M.D.	C.D.	Tensile strength retained when wet M.D.	C.D.	Stretch M.D.	C.D.	Stiffness M.D.	C.D.
lbs.	*lbs.*	*points*	*points*	*points*	*g.*	*g.*	*lbs./in.*	*lbs./in.*	%	%	%	%	*g.*	*g.*
							Sample P. Duplex; Cellulose Wadding Infused with Asphalt							
425	350	97	41	41	630	930	31.3	11.1	76	65	11	13	700	410
							Sample Q. Duplex; Cellulose Wadding Infused with Asphalt and Coated on One Side with A							
587	510	91	...	...	760	940	26.7	11.0	105	71	26	14	660	340
							Sample R. Triplex; Cellulose Wadding Infused with Asphalt							
605	510	135	...	...	920	...	43.5	11.8	116	87	17	15	1,000	500
							Sample X. Kraft Paper with Lead Foil Laminated to One Side and Scrim Cloth Laminated to the							
301	...[2]	86	98	102	990	...	54.9	31.9	66	74	3	5	200—	200—
							Sample Z. Cloth, One Side Vinyl Coated							
255	None	125	271	336	690	890	71.3	46.2	107	122	8	24	...	...
							Sample FF. Duplex; Kraft Paper Laminated with Asphalt to Cellophane Sheet							
155	90	73	21	23	190	190	30.3	25.6	27	20	15	10	200—	210
							Sample II. Triplex; Kraft Paper Laminated with Asphalt to Both Sides of a Cellophane She							
222	110	80	32	32	350	400	44.1	41.9	25	18	15	7	330	650

[1] M.D.—Machine direction, C.D.—Cross direction.
[2] All omissions are because satisfactory test data could not be obtained due to the nature of the material.
[3] Inside and outside indicate the positions of the sides of the material in the case liner made from it. Physical tests made at 50% relative humidity and 73 deg. F.

TABLE IV—RESISTANCE OF MISCELLANEOUS CASE-LINING MATERIALS TO WATER AND WATER VAPOR

Water resistance, hrs. — *73° F.—50% R.H.*				*Water vapor permeability, g./m.²/24 hrs.* — *73° F.—50% R.H.*				*100° F.—90% R.H.*			
Side[1] 1		*Side 2*		*Side 1*		*Side 2*		*Side 1*		*Side 2*	
Uncreased	*Creased*	*Uncreased*	*Creased*	*Uncreased*	*Creased*	*Uncreased*	*Creased*	*Uncreased*	*Creased*	*Uncreased*	*Creased*
Sample P. Duplex; Cellulose Wadding Infused with Asphalt											
100+[2]	84–100+	100+	73–100+	0.5	5.8	0.5	1.9	4.3	28.0	4.8	11.4
Sample Q. Duplex; Cellulose Wadding Infused with Asphalt and Coated on One Side with Asphalt											
100+	100+	100+	100+	0.3	0.4	0.3	0.5	2.8	2.9	2.7	3.3
Sample R. Triplex; Cellulose Wadding Infused with Asphalt											
100+	86–100+	100+	54–100+	1.1	0.6	0.5	0.5	6.4	4.6	4.0	3.9
Sample X. Kraft Paper with Lead Foil Laminated to One Side and Scrim Cloth Laminated to the Other Side											
100+	100+	100+	100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sample Z. Cloth, One Side Vinyl Coated											
3	3	14	16	9.4	10.2	7.0	7.1	89.5	98.0	68.4	70.2
Sample FF. Duplex; Kraft Paper Laminated with Asphalt to Cellophane Sheet											
78	38	72–100+	72	2.1	2.4	1.9	1.7	21.5	24.5	16.0	14.4
Sample II. Triplex; Kraft Paper Laminated with Asphalt to Both Sides of a Cellophane Sheet											
20	25	31	27	2.0	2.2	1.7	2.2	19.3	21.8	15.1	21.6

[1] Side 1 and Side 2 indicate the side exposed to water or water vapor. Side 1 is the outer side of the material in the case liner made from it.
[2] All tests for water resistance were discontinued at the end of 100 hours.

TABLE V—BLEEDING TESTS OF CASE-LININGS

Nature and degree of staining of white paper in contact with both sides of test specimens at 150° F. and under pressure of 72 lbs./sq. ft. for 5 hrs.

Sample designation	
A	Slight asphalt staining, spots; brown wax stains
B	Moderate asphalt staining, streaks
C	No staining
D	One side considerable asphalt staining, spots; other side (infused) slight asphalt staining, spots
E	Slight to moderate asphalt staining, spots
F	No staining
G	No staining
H	No asphalt staining, brown wax spots
J	No asphalt staining, brown wax spots
K	One side moderate asphalt staining, spots; other side (infused) slight asphalt staining, spots
M	No asphalt staining, brown wax spots
O	Moderate asphalt staining, streaks
P	One side no staining; other side slight asphalt staining; test paper sticks partly to case-lining material
Q	Considerable asphalt staining; test paper sticks to case-lining material
R	Considerable asphalt staining; test paper sticks to case-lining material
S	Infused side, considerable asphalt staining; other side, slight asphalt staining
T	Infused side, considerable asphalt staining; other side, no staining
U	No staining
V	No staining
W	Moderate asphalt staining, streaks
AA	Very considerable asphalt staining. Test paper laminated firmly to case-lining material
BB	No asphalt staining, slight wax stains
CC	Moderate asphalt staining, spots. Test paper sticks around edges of case-lining material
DD	Very considerable asphalt staining. Test paper laminated firmly to case-lining paper
EE	No staining
FF	Slight asphalt staining, brown wax spots
GG	No asphalt staining, brown wax spots
HH	No asphalt staining, brown wax spots
II	Slight asphalt stain, one side; other, brown wax spots

MATERIALS

Resistance to scuffing — *N.B.S. wet rub*		*Taber dry rub*		*Acidity, hot extraction*
M.D.	*C.D.*	*Inside[3]*	*Outside[3]*	
double rubs	*double rubs*	*rev./cg.*	*rev./cg.*	*pH*
3,800	3,100	...	...	7.5
sphalt				
3,600	3,300	...	...	7.3
4,700	4,000	...	...	7.5
Other Side				
2,800	2,600	500	...	...
13,000	9,000	321	115	...
550	430	6	156	5.0
et				
690	700	10	7	6.1

TABLE VI—RELATIVE RATING OF CASE LINERS ACCORDING TO SIMULATED SERVICE TESTS

Col:	1	2	3	4	5	6	7	8	
Position No.	Av. no. of holes and tears		Weighted av. no. of holes		Liners with no holes or tears		Contents dry		Composite rating
	Tropic	Arctic	Tropic	Arctic	Tropic	Arctic	Tropic	Arctic	
					%	%	%	%	
1	O 0.0	C 0.0	O 0.0	C 0.0	O 100	C 100	O 100	A 100	Z 25
2	Z 0.1	W 0.1	T 0.1	Z 0.2	T 93	W 93	R 100	C 100	W 28
3	T 0.1	Z 0.2	Z 0.3	W 0.3	Z 87	Z 90	P 93	K 100	O 48
4	W 0.3	V 0.3	W 0.9	A 0.8	W 80	A 80	Z 92	W 100	K 51
5	EE 0.3	A 0.4	EE 1.5	K 1.6	EE 80	K 73	W 87	Z 96	C 60
6	R 0.3	H 0.4	R 2.1	V 1.9	K 67	V 73	DD 87	BB 93	A 62
7	U 0.8	K 0.4	DD 2.5	DD 2.5	R 67	CC 73	EE 87	DD 93	DD 70
8	K 0.9	EE 0.5	K 2.9	GG 2.6	U 53	H 67	A 80	HH 93	EE 70
9	CC 1.0	U 0.5	C 3.6	HH 2.9	DD 53	U 67	K 73	II 93	H 85
10	DD 1.0	O 0.5	H 4.8	H 3.1	C 50	EE 67	Q 73	D 87	T 89
11	H 1.2	CC 0.5	U 5.1	EE 3.5	CC 40	O 60	U 73	O 87	U 91
12	Q 1.6	DD 0.7	A 5.7	O 3.8	H 33	DD 60	CC 53	T 87	CC 91
13	A 1.7	GG 0.7	CC 7	T 4.1	Q 27	HH 60	H 50	X 87	V 103
14	B 1.8	HH 0.8	Q 8	CC 4.1	B 27	D 47	HH 47	CC 87	R 117
15	C 2.2	T 0.9−	B 10−	U 4.7	A 20	M 47	II 47	H 80	HH 128
16	S 2.7	B 0.9	P 10	D 7−	P 20	GG 47	AA 40	M 80	GG 132
17	P 2.9	M 1.1	GG 10	BB 7	V 13	BB 40	V 33	V 80	B 135
18	V 4.2	BB 1.1	V 11	B 7+	AA 13	B 33	X 33	GG 80	P 152
19	AA 5.2	D 1.3	HH 11	M 9	GG 13	J 33	GG 33	EE 73	Q 154
20	BB 5.3	J 1.4	AA 13	J 10	D 7	T 33	B 30	B 67	BB 154
21	HH 6.1	AA 1.7−	S 23	AA 13	E 7	E 27	C 30	U 67	D 155
22	GG 7.2	R 1.7	BB 24	E 13+	S 7	AA 20	T 27	E 60	AA 165
23	E 12.4	E 1.9	X 26	II 15	F 0	Q 7	J 20	J 60	M 173
24	D 13.1	P 2.7	D 28	R 17	G 0	R 7	FF 20	FF 60	J 182
25	II 13.6	Q 3.6	E 34	X 21	J 0	P 0	M 13	P 53	II 187
26	J 21.1	II 4.1	J 34	P 24	M 0	S 0	BB 13	R 47	X 189
27	X 25.0	S 4.2	M 38	S 27	X 0	X 0	S 7	S 47	S 193
28	M 28.2	FF 19.5	F 49	Q 35	BB 0	FF 0	D 0	AA 47	E 195
29	FF 32.5	X 19.7	II 60	FF 53	FF 0	II 0	E 0	Q 33	FF 221
30	F 35.4	F ..	FF 127	F ..	HH 0	F ..	F 0	F ..	F 231
31	G 341.0	G ..	G 358	G ..	II 0	G ..	G 0	G ..	G 241

to water vapor. Otherwise, according to this theory, moisture which may form on the inside of the package from condensation due to changes of temperature will have no means of escape and may promote corrosion of the product.)

If it is desired to add some additional safeguard, it may be useful to add an abrasion value by the Taber instrument of not less than 10 or 12 revolutions per centigram on either side.

Based wholly on tests of physical properties, such a combination as that given above eliminates with little uncertainty the case liners in Group II, while retaining all but 5 in Group I. Of these 5, three (Z, T and V) are eliminated because they are not considered good enough as moisture barriers; the other two (U and CC), because of low stretch.

Recommended standards

In a meeting attended by the Task Group and representatives of the War Department, the Navy Department, and the National Bureau of Standards, it was agreed that:

1. It is possible to correlate National Bureau of Standards physical tests on case-liner materials with performance results on case liners made from them tested at Package Research Laboratory.

2. Based on such correlation, and without taking into account load, box construction, box size and handling, a satisfactory case-liner material can be defined as follows:

The case-lining material should be asphalt-laminated kraft paper having the following properties:

Total asphalt per 500 sheets, 24 by 36 in., not less than 150 lbs.

Total kraft paper per 500 sheets, 24 by 36 in., not less than 90 lbs.

Stretch, average of both directions, not less than 10%.

Tearing resistance, average of both directions, not less than 400 grams.

Tensile strength, average of both directions, not less than 40 lbs. per inch width. Variations below the minimum tensile strength requirement are permissible provided they are compensated by an increase over the tearing strength requirement in the ratio

of 10 units of tearing strength to 1 unit of tensile strength.

Puncture resistance (Beach), average of both directions, not less than 40 units.

Water resistance, on creases made at 40 deg. F., average of both sides, not less than 16 hours.

Water-vapor permeability at 100 deg. F. and 90% relative humidity, on creases made at 40 deg. F., average of both sides, not more than 20 grams per square meter per 24 hours. (*See Editor's Note, preceding page.*)

In the foregoing specification, the tensile-strength requirement is coupled with the tearing-resistance requirement in a manner that seems rather awkward and strained, in order not to eliminate obviously good liners that have a tensile strength of less than 40 lbs./in. It has already been pointed out that tensile strength, with one possible exception, seems to have very little relation to the classification of liners by the simulated service tests. Since the specification confines acceptable case liners to those composed of kraft paper, laminated with asphalt, it becomes unnecessary to include a tensile-strength requirement solely to eliminate those miscellaneous liners (P, Q and R) found unsatisfactory under arctic conditions. It is recommended, therefore, that the tensile strength requirement, and perhaps also the requirement for tearing resistance be omitted, and that a wet-tensile-strength requirement of not less than 10 lbs./in. be substituted.

Acknowledgment

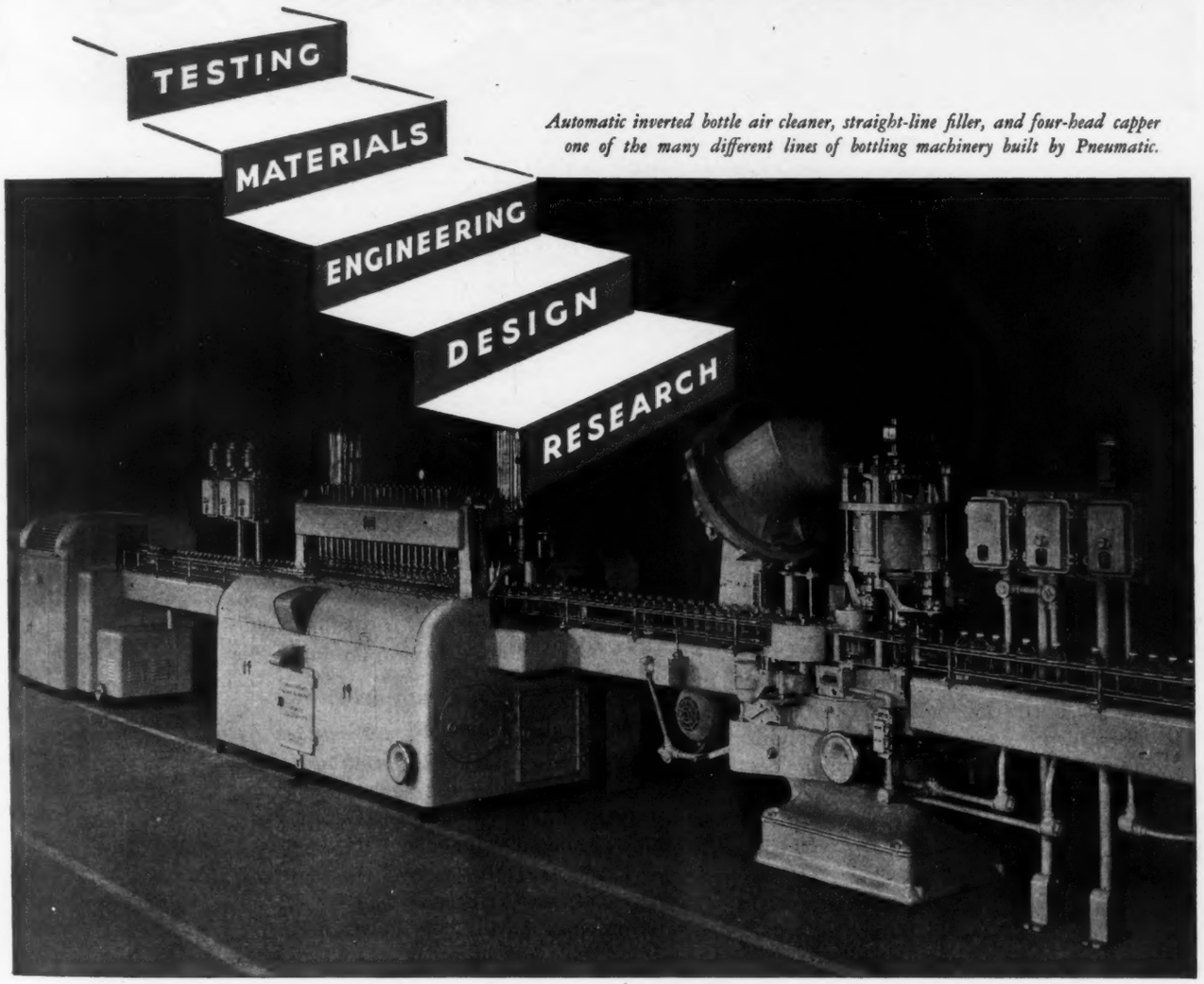
The assistance of V. Worthington, Irma G. Callomon, Thelma L. O'Brian and Alice J. Adams in performing the testing reported herein is gratefully acknowledged by the authors.

TABLE VII—AVERAGE VALUES OF PHYSICAL PROPERTIES[1] OF CASE LINERS, ARRANGED IN ORDER OF COMPOSITE RATING (TABLE VI)

Designation	*Bursting strength*	*Puncture resistance*	*Tearing resistance*	*Tensile strength*	*Wet-tensile strength*	*Stretch*	*Stiffness*	*Resistance to scuffing*		*Water resistance creased at 40° F.*	*Water-vapor permeability at 100° F. 90% R.H. creased*
								N.B.S. wet	*Taber dry (min.)*		
	points	*Beach units*	*g.*	*lbs./in.*	*lbs./in.*	*%*	*g.*	*hundred oscillations*	*rev./cg.*	*hrs.*	*g./m.²/d.*
					Group I						
Z	125	304	790	59	66	16	200−	110	115	10	84
W	124	53	640	51	19	10	820	6	48	21	19
O	117	228	1,010	55	26	23	980	6	22	60	16
K	110	53	565	49	12	10	870	11	24	50	10
C	110	70	..	42	15	10	710	8	13	26	13
A	80	182	715	30	15	26	495	29	42	100+	3
DD	98	250	845	51	21	16	790	3	16	80+	9
EE	116	62	..	50	24	11	845	22	24	31	17
H	95	44	475	40	10	15	705	12	22	85+	8
T	110	40	435	47	15	11	550	4	8	46	47
U	104	54	..	42	24	5	725	20	30	29	16
CC	88	45	540	57	16	6	845	10	17	80+	7
V	57	65	355	30	6	15	325−	2	15	15	18
					Group II						
R	135	..	..	28	30	16	750	44	..	85+	4
HH	61	61	350	33	8	10	465−	11	6	41	14
GG	88	29	355	36	11	6	340	4	5	44	15
B	88	35	415	39	13	7	425	6	67	60	14
P	97	41	780	21	15	12	555	35	..	90+	20
Q	91	..	850	19	18	20	500	35	..	100+	3
BB	69	51	330	34	9	12	440	6	9	23	27
D	112	36	475	71	10	4	1,020	9	10	13	39
AA	77	32	470	47	11	4	590	9	9	100+	7
M	110	28	425	68	8	4	750	5	10	80+	32
J	100	26	410	63	6	4	770	8	11	90+	75
II	80	32	375	43	9	11	490	7	7	26	22
X	86	100	..	43	30	4	200−	27	..	100+	0
S	108	23	335	56	10	5	630	8	8	39	20
E	71	30	405	52	6	5	645	5	19	100+	14
FF	73	22	190	28	7	13	200	5	6	55	15
F	103	46	..	57	13	3	700	4	11	17	28
G	72	30	..	51	15	4	440	2	14	11	43

[1] All tests made at 73 deg. F. and 50% R.H., except water-vapor permeability. Values, except Taber, are averages of both directions, or of both sides.

5 VITAL STEPS TO DEPENDABLE BOTTLING



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Aluminum foil labels

QUESTION: In the March issue of MODERN PACKAGING *in this department, you answered an inquiry regarding a label that would be resistant to disintegration or removal when the package is handled by wet hands or stored in extremely moist places. Why did you not mention aluminum foil labels as satisfactory for this requirement?*

ANSWER: Aluminum foil labels should have been mentioned in the answer to this original question. Aluminum foil laminated to a paper base with a waterproof glue or a synthetic resin adhesive would have a highly satisfactory degree of resistance to being handled by wet hands or for storage in moist places.

As a matter of fact, such labels made from light gauge aluminum foil laminated to thin papers have been developed for bottle labeling for beer and soft drinks. The labels in this case are expected to undergo immersion in ice water without coming off the bottle or without affecting their appearance. Such labels have also been used for canned products and household cleansers handled with wet hands or left in damp places with very good results.

It is necessary whenever such foil labels are used that the laminating agent of the foil to the paper be a waterproof type and also the means to adhere the label to the fibre can, metal can or bottle be of such a type that it is resistant to softening and solution by water. This is particularly true for applications to bottles where the label adhesive contacts water around the edges.

Moisture condensation on cellophane

QUESTION: We have been trying to develop the packaging of Persian Limes in cellophane bags. We find that when we put air holes in the bag they seem to keep the limes very well. However, we do have the difficulty of condensation of moisture, even though we have punched the bag with holes. We would like your recommendations.

ANSWER: You will probably observe condensation in bags of limes packaged in any one of the transparent films if held at room temperature. Condensation can be reduced by cool storage and will be increased if the bag is exposed to direct sunlight or in bags which are piled together. The usual grades of moistureproof cellophane will not behave noticeably different from any other transparent film and even non-moistureproof films such as cellulose acetate or vinyl films can be expected to show similar behavior. The purpose of punching holes in these bags is to allow the escape of excess moisture, but you may find it necessary to punch a large number, say, several dozen $^1/_4$-in. diameter holes in a bag holding a dozen limes to prevent condensation from occurring.

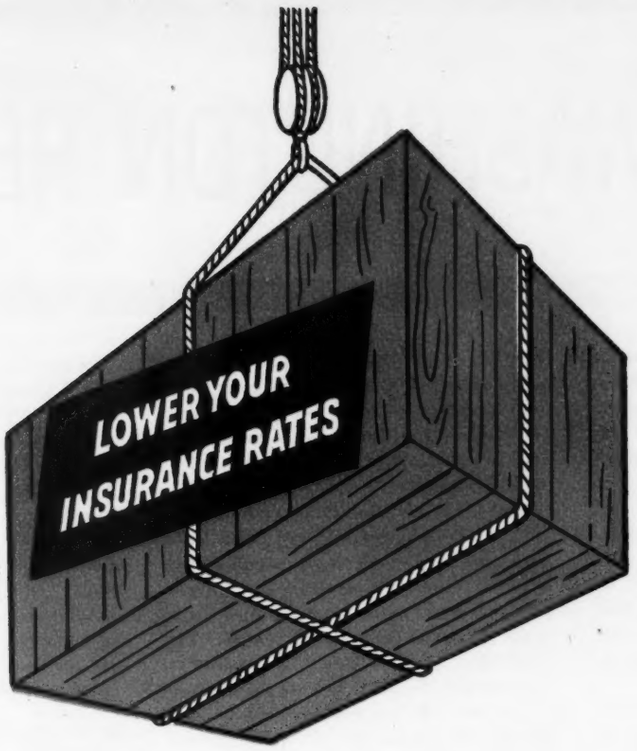
It is suggested that you try bags made from cellulose acetate or transparent vinyl films and punch different numbers of holes in your samples to find out the number of holes and the kind of film which perform best with this particular fruit and under your conditions of shipping, storage and retail display.

Is PVA solvent resistant?

QUESTION: I am confused by what appears to me to be a mistake or a contradiction in the article "Polyvinyl Alcohol and Acetate for Packaging" which appeared in the October, 1945, issue of MODERN PACKAGING, *p. 160. The paragraph which numerates the practical possibilities of polyvinyl alcohol film states that this material is solvent resistant. At the same time, some of the technical data in the table, listing properties of polyvinyl alcohols, show that this material softens or dissolves in solvents.*

ANSWER: You must remember that the words "polyvinyl alcohol" covers a wide range of different molecular weights, other chemical modifications and that a finished film would also contain added plasticizers, etc. In general, polyvinyl alcohols of molecular weights suitable for forming into films are soluble in varying degrees in water, certain water alcohol mixtures and complex chemical compounds, some of which are suitable as plasticizers for polyvinyl alcohol.

In the article referred to, it says that polyvinyl alcohol has excellent solvent resistance. The word "solvent" in this case refers to pure organic materials as typified by alcohol, naphtha, esters, ketones, ethers and many other volatile materials. This grading of "excellent" means that polyvinyl alcohol is not affected by nearly all of these materials. It does not necessarily mean, however, that certain volatile organic materials might not soften some grades of polyvinyl alcohol.



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WASHINGTON REVIEW

● **Export Cans**—Agriculture Department and Civilian Production Administration have made representations to the Department of State in an effort to ease the tinplate and metal container shortage through curtailment of exports of plate and containers. Briefly, the story is that the two first-named agencies seek to assure adequate cans for fresh food products this year; State, on the other hand, seeks to maintain and build up foreign good will and trade, has commitments which would necessitate shipping some 110,000 tons of tinplate abroad in May and June.

Until the coal strike was called, the steel mills, operating under CPA directives to keep the plate mills operating, as well as the can companies were doing a good job in the opinion of Government agencies, and had plate production up to 85 to 90% of total capacity. Before the strike it appeared that by July 1 the output would take care of all seasonal requirements for fresh food products. Then when the strike struck, steel mills began banking their furnaces and, while CPA sent out wires urging them to keep plate mills running, those faced with a fuel shortage were unable to do so.

As a result, the estimated domestic requirements and export commitments for tinplate for the first six months of this year now appear to be about 90,000 tons over any reasonable expectation of production. As pointed out above, the total export requirements for May and June alone amount to 110,000 tons.

The expected purchase of between 30 and 50 million pounds of frozen eggs by Britain, which would greatly ease the domestic egg surplus, is in jeopardy because of lack of cans.

Agencies in this country believe that one way the plate export problem can be eased is for Britain to get her tinplate mills going again and begin supplying the usual markets instead of using what steel production she now has for the making of automobiles, gadgets and other products felt to be less essential than tinplate.

● **Housing vs. Packaging**—With Washington attention, particularly in the higher policy levels, concentrated on housing—the need for which no one denies—makers and users of wooden containers may find themselves in the middle of another shortage. From the White House down through the Housing Administration, CPA and other economic agencies has come word that incentive of the lumber industry must be concentrated on housing materials—with a higher priority and price for 2 × 4's than for box shook.

Since it's much easier to make dimension lumber than shook and other wood packaging materials, those manufacturers who can readily swing from one type of production to another may be expected to make what the Government wants. The result will be that only those manufacturers whose facilities are set up for container materials exclusively will be producing these materials. The Agriculture Department feels that without an adequate supply of shook to handle perishables, there may be a wastage of food. Accordingly, efforts are in progress to attempt to establish some sort of workable relationship between incentives for production of container materials and building materials, since the world food situation could be further aggravated by too much emphasis on domestic housing.

● **Aluminum Use**—One packaging material of which there continues to be an adequate supply is aluminum. Commerce Department points out that "total annual consumption for many years to come is expected to be but a mere shadow of the wartime use." Estimated production in 1945 was 1,660,000,000 lbs., about two-thirds the peak production in 1943, but more than four times production in prewar years, the Department points out. In an article in a recent issue of *Domestic Commerce*, Daisy L. Schooley of the Machinery and Metals Division, Office of World Trade Promotion of the Department, points out that packaging developments during the war years assure wide and expanding use for foil and other aluminum packaging applications in the immediate future.

● **Glass Container Output Up**—February production and shipments of glass containers were more than 20% greater than in February, 1945, Census Bureau reports. Production and shipments amounted to 8,987,000 and 9,032,000 gross, respectively, compared with 7,364,000 and 7,435,000 gross in February, 1945.

● **Lead Controls to Continue**—How tight the lead situation is may be judged from its mention in a recent speech by CPA Administrator Small before the National Retail Federation. In discussing the type of controls still exercised over a few scarce articles, he mentioned tin, lead and rubber as examples. "Our controls over lead, for example," he said, "make it possible to produce enough batteries to keep our cars and trucks and buses running. Without these controls we might have more toy soldiers and more lead foil on cigarettes, but fewer cars on the road." He indicated that lead controls will continue for some time.

● **New Publication**—The report, "Postwar Packages and Containers for Marketing Foods," which was presented in condensed form in the March, 1946, issue of MODERN PACKAGING, has been released and may be obtained from the Bureau of Agricultural Economics. There is no charge for the mimeographed report.

● **OPA Survey of Wooden Containers**—Office of Price Administration is making an over-all cost survey of the entire agricultural wooden container industry, which may result in new price increases for the containers. The agency made the fact it was making the survey known in its announcement of a 10% interim price increase applicable to manufacturers' sales of strawberry crates, complete with berry cups and dividers as well as to the individual items. Buyers of the crates will absorb the increase, OPA said.

● **Increase in Paperboard**—OPA has allowed an increase of $4 per ton in manufacturers' ceiling prices for container chip paperboard produced east of the Rocky Mountains. The new ceilings are $56.50 per ton on board up to $^{16}/_{100}$ of an inch thick, and $54 per ton on thicker board. Makers of paperboard recently were granted price ceiling increases on other types to bring them up to their approximate 1936–39 earnings.

● **Ceiling Increases on Machinery**—Ceiling prices for all machinery, parts and industrial equipment have been increased 4% where the percentage of steel costs in selling prices is over 40%. Increase was made at all levels of sales, effective March 25 and authorized, it is said, to compensate producers for higher steel costs resulting from steel price advances.

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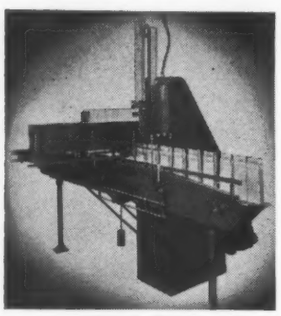
AUTOMATIC BAG INSERTER

Benj. C. Betner Co., Devon, Pa., has specially designed and now makes available commercially an automatic high-speed bag inserter which takes a bag from a hopper and by one operation inserts it into a carton fully opened and ready for filling. In operation, the bag inserter takes from the hopper, which holds approximately 1,000 bags, a bag which is opened out by suction and into which a plunger is thrust inserting the bag into a carton. When the plunger withdraws from the bag and carton, a blast of air is forced down through the plunger holding the bag in the carton until the plunger is entirely withdrawn. By means of two suction cups, placed on the side of the machine, the tucks of the bag are pulled out so that the bag is opened and squared.

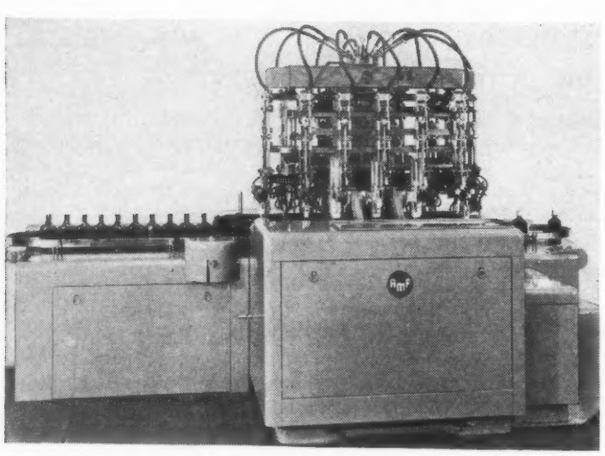


PROTECTIVE PADDING AND CUSHIONING

A new felted, wood fibre blanket material, known as "Tufflex," a product of Wood Conversion Co., St. Paul, Minn., is said to be highly resilient, flexible and non-abrasive. War-tested on Army and Navy assignments, such as protection for instruments both from freezing temperatures and shocks of parachute landing, this material is now available for the protection and cushioning of fragile and delicate merchandise. Various densities are made and processed to resist moisture, mold and vermin. It may be slit or die cut to size in any shape. Two types are available, in rolls or sheets in thicknesses of 1/4 in., 1/2 in., 1 in. and 1 1/2 in., one with and one without a waterproof binder. Can be supplied with paper backing, either creped or plain kraft on either one or both sides, according to use requirement.

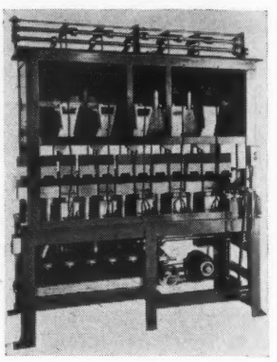
APPLIES CELLULOSE BANDS AUTOMATICALLY

American Machine & Foundry Co., New York, has developed a machine which automatically applies a cellulose band to the neck of bottles and jars, creating a positive seal between bottle and primary closure, at a speed ranging from 120 to 150 per minute. The machine, which has the advantage of spotting the band, exactly, eliminates all hand operations and results in substantial labor saving costs.



AUTOMATIC WEIGHT ADJUSTER

A new automatic weight adjuster that may be used in the packaging of frozen foods such as peas, beans, corn, etc., as well as other products such as hard candy, crackers, nuts and bolts has been developed by the Fred Goat Co., Inc., Brooklyn, N. Y. Operating automatically at high speed, the machine receives partially filled packages from volumetric or rough weight fillers and adds sufficient material to bring the packages up to the desired gross weight. Travelling through the machine on a conveyor in timed cycles, the packages pass through a series of stations at each of which progressively smaller amounts of materials are added as required, until the package is brought up to the desired final weight. Material is added at each station only if the weight of the package upon reaching that station is below the present weight limit of that station. Machine handles 60 one-pound packages per min.



PHOTOELECTRIC COUNTING DEVICES

Combining the use of a photoelectronic circuit with an optical system, in which a short light beam is sharply focused through an aperture in a steel tube or guide, the "Shadowcount" affords a high speed accurate method of counting objects hitherto uncountable because of small size or light weight. The instrument, made by The Autotron Co., Danville, Ill., accommodates objects ranging in size from 1/32 in. to 1 7/8 in. cross sectional dimension. It may be obtained in several models or types with various ranges of speeds, possible by simple adjustment; the maximum counting speed is 1,000 per minute. May also be used at point of inspection and in stock room.

Potter Instrument Co., Flushing, N. Y., announces that its Dual Predetermined Electronic Counter is being used in the counting and packaging of small items such as pills, buttons, etc. This unit eliminates almost entirely the usual manual operations necessary in ratio weighing. Control may be set up by discrete predetermined numbers. The instrument employs four of the company's 4-tube, counter-decade circuits which are arranged to give two independent predetermining channels in which any number up to 10,000 may be initially set up by manipulating rotary switches mounted on the front panel. Each channel is alternately automatically preset to the desired predetermined number by self-contained circuits in less than one millisecond.

INSULATING CASE LINER

The Merkle Corp., Philadelphia, Pa., originator of buckwheat hulls as a package insulating material (see "Dry Ice Control," MODERN PACKAGING, March 1944, pp. 158–160), has developed an insulating case liner for use by florists for bulk shipment of pre-cooled cut flowers. The liner is a lamination of kraft paper and asphalt, with a layer of buckwheat hulls in the center, said to be waterproof. In flower shipments, the liner is used with or without the special "dry ice control" unit, depending upon whether or not the flowers are of a variety susceptible to the carbon dioxide given off by the dry ice. Similar packages are said to be suitable for fresh unfrozen fish fillets, crabs and oysters, fresh poultry, blood and blood plasma, and cultured milk.

WIRZ Collapsible Metal Tubes *match your markets' demands* for attractive, protected, convenient packages . . .

The highly competitive markets ahead make an attractive, well-protected, convenient package imperative . . . especially if your product is a liquid, cream, paste or powder. You can be sure your package embodies all these advantages if it is a WIRZ Collapsible Metal Tube.

WIRZ Collapsible Metal Tubes are protection-convenience packages. They are carefully designed with—

1. Sound, even walls to keep your product free from contamination, atmospheric action, damage in transit and use.
2. Proper self-dispensing shape for convenience and economy.
3. Smooth, even finish, takes colorful inks to enhance the appeal of your product and make it easy to remember.

Let us help you plan a package that increases eye-appeal, protects your product and adds convenience . . . a package that matches your markets' demands.

A. H. WIRZ, INC.

Established 1836 . . . . . Fourth & Cole Streets

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Export Division—751 Drexel Building, Philadelphia 6, Pa.

NEW YORK 17, N. Y. 50 E. 42nd St.

HAVANA, CUBA Roberto Ortiz Planos

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Collapsible Metal Tubes • Lacquer Linings • Wax Linings • Wostite Closures • Soft Metal Tubing • Household Can Spouts • Applicator Pipes • Compression Molding

Plants and People

Dominion Foils, Ltd., Canada, has appointed **Bulkley, Dunton & Co., Inc.,** New York, as exclusive U. S. sales agents for their aluminum and composition foils. The Canadian concern operates two mills, both in Quebec, with na annual capacity in excess of 18,000,000 lbs. of high-grade foils. Both mills are equipped to produce finished products from ingot stock, including embossed, colored and printed foils.

Purchase of **The A. H. Ross Co.,** package machinery manufacturer, by **Rockwell Mfg. Co.,** Pittsburgh, has been announced by Col. Willard F. Rockwell, chairman and president of the latter company. A. H. Ross, president and principal stockholder of the Ross Co., will become vice-president and general manager of the packaging machinery division of Rockwell and the company will continue to operate under the name of A. H. Ross Co., maintaining its plant in Ludlow, Ky.

Mr. Sumner

Howard A. Sumner, former president of the Packaging Institute, has been elected vice-president and director of **The Norwich Pharmacal Co.,** Norwich, N. Y. Elected as vice-president in charge of production is **George W. Bengert.**

Rejoining the **Gardner-Richardson Co.** after military service are E. T. Gardner, Jr., assistant to the president; Milton S. Johnston, Jr., sales department of the paraffined carton division; R. B. Worford, general sales offices of the folding box division; and Earle G. Turvey, Chicago sales office.

Henry N. Russell and **H. Milton Anderson** announce the formation of a studio under the name of **Russell-Anderson,** with offices at 465 W. 23rd St., New York, to handle the development and production of printed pieces, and packages.

The Empire Box Co., Garfield, N. J., announce the opening of a new sales office under Gordon H. Helm, at 797 E. 17th St., Los Angeles 17. A new office in Richmond, Va., to handle sales for Virginia, North Carolina and South Carolina will be headed by Edward I. Wallerstein and R. H. Hamilton.

Minnesota Mining & Mfg. Co., St. Paul, Minn., announces the appointment of **J. J. Bennison** as sales manager of the "Scotch" tape division, Chicago.

A. Fleisig Sons Folding & Setup Paper Box Co. is now located at 472 Broadway, New York 13.

Trans-Pac Services, Inc., makers of food, drug and cosmetic packages, announce the removal of their plant from New York to 66 S. 8th St., Newark, N. J.

E. C. Griepenkerl has been appointed to represent **Kennedy Car Liner & Bag Co., Inc.,** Shelbyville, Ind., on the West Coast, with headquarters at 1119 Armada Drive, Pasadena, Calif.

Walter S. Nuckols has been released from the Navy and is back with **Swindell Bros., Inc.,** glass container manufacturers, as manager, New York sales office.

Name of the Harris-Seybold-Potter Co., Cleveland, Ohio, has been changed to **Harris-Seybold Co.** The Morrison stitching machine division of the company has been acquired by **Acme Steel Co.,** Chicago.

Muirson Label Co., Inc., Peoria, Ill., announces that **George R. Langlois,** former vice-president of the National Assn. of Manufacturers, will fill the new position of general sales manager, with headquarters in San Jose, Calif.

The Armstrong Cork Co., Lancaster, Pa., announces the following appointments in its glass and closure division: **V. A. Game,** assistant commodity manager for metal and molded caps; **R. H. Hetzel,** assistant commodity manager for glass containers; and **W. W. Pedrick,** 3rd, assistant in drug sundries sales.

The Thatcher Manufacturing Co., Elmira, N. Y., plans the erection of a new $1,500,000 unit in Olean, N. Y.

American Machine & Foundry Co.'s research and development division has changed its location. The new mailing address is P. O. Box 187, Station F, Buffalo 12, N. Y.

Organization of **Federal Adhesive Corp.,** a new manufacturing and supply firm, 640 Dean St., Brooklyn, N. Y., has been announced. Officers of the firm include **Philip M. Liner,** president, **Mortimer E. Stern,** vice-president in charge of production, and **Arthur Mayer,** vice-president in charge of sales.

Speed & Co., Inc., advertising agency, Baltimore, Md., announce the removal of their offices to 31 S. Calvert St.

L. Chambon Corp., makers of rotary printing presses, announces postwar re-establishment of press manufacture, maintenance and engravings, at 320 West 46th Street, New York.

Electronic Advertising, Inc., New York, makers of the electronic merchandiser, announces the appointment of **J. Franklin Dorsey** as director of national sales. Mr. Dorsey formerly directed baking industry activities of Milprint, Inc.

Rotogravure Engineering Co., New York, announces the appointment of **Emory W. Worthington** as vice-president and chief engineer, and **John W. Kight** as vice-president and assistant treasurer. **Frank W. Hyman** has resigned from active membership in the firm but will continue as a consultant. New offices in the Empire State Bldg.

Mr. Worthington

Sperry Corp., has acquired the **E. G. Staude Manufacturing Co.,** St. Paul, Minn. The company, manufacturer of automatic machinery for producing paper boxes and envelopes, will be operated as a division of the Sperry Corp.

Personnel changes by **Continental Can Co., Inc.,** include the names of **P. P. Wojtul,** appointed assistant to the executive vice-president; **H. A. Swertfeger,** assistant to the vice-president and comptroller; **R. W. Shaver,** general manager of the paper mill division; **John Jennings,** southeastern district manager of paper container sales, with headquarters in Atlanta; **L. C. Walgash,** chief industrial engineer, to succeed W. W. Hodgson, retired; and **Blake Smith,** sales representative in the Omaha, Neb., territory.

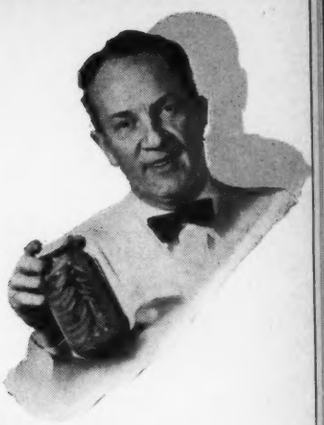
The **Package Machinery Co.,** Springfield, Mass., announces the appointment of **E. G. Westervelt** as manager of its New York office and **Ernest Hjelm** to handle the Southeastern sales district operating from Atlanta, Ga.

Sutherland Paper Co., Kalamazoo, Mich., has announced plans for a $3,000,000 expansion to include two new plants, one to house cup machinery and the other to contain color printing presses, cutting machinery and ink processing space.

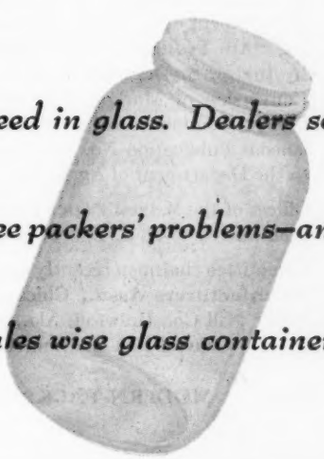
Gerald B. Cloran, for 13 years sales promotion manager of National Adhesives, Div. of National Starch Products, Inc., died on April 28 after a short illness.

Clement H. Shelley, advertising manager of **Fibre Containers** and long associated in the packaging publications field, died in Chicago on March 18.

VISION



Housewives see what they need in glass. Dealers see easy handling—sound merchandising. We see packers' problems—and answer them with efficient, good looking, sales wise glass containers.



Hazel-Atlas Glass Company • Wheeling, W. Va.

For Your Information

What's doing

May 12–15—**National Paper Box Manufacturers Assn.,** annual convention, Drake, Chicago.

May 14–17—**Lithographers National Assn., Inc.,** Marlborough-Blenheim, Atlantic City.

May 15–17—**Toilet Goods Assn.,** annual convention, Waldorf-Astoria, New York.

May 16–17—**Associated Cooperage Industries of America, Inc.,** annual meeting, New Jefferson, St. Louis.

June 3—**Michigan Canners Assn.,** spring meeting, Park Place, Traverse City.

June 6—**Flexible Packaging Institute,** Drake, Chicago.

June 11—**Liquid Tight Paper Container Assn.,** monthly meeting, Waldorf-Astoria, New York.

June 17–19—**Grocery Manufacturers of America, Inc.,** mid-year meeting, Shawnee-on-the-Delaware, Penna.

June 24–28—**American Society for Testing Material,** 49th annual meeting and exhibit, Statler, Buffalo.

June 24—**Twentieth Annual Confectionery Industries Exposition,** Stevens Exposition Hall, Chicago.

June 25–27—**National Confectioners' Assn.,** 63rd annual convention, Stevens, Chicago.

The first postwar national conference of the **Society of the Plastics Industry** and the concurrent **National Plastics Exposition** April 23–25 in Grand Central Palace, New York, gave a glimpse of future packaging in plastics. Drawn and shaped rigid and semi-rigid cellulosics and vinyl sheets; elegant fabricated and carved acrylic glamor packages; cast unsupported films in a wide variety of designs; phenolics, melamines and ureas in re-use boxes and containers; laminates of many types, and quite a number of metal-plated plastic packaging items were on view. There were a few examples, also, of plastics used in combinations with wood and metal for packaging, and exhibits illustrating the display use of fluorescent plastics.

Wastage of display material in drug packaging highlighted the preliminary report by **W. R. James,** of **Towns & James, Inc.,** Brooklyn, chairman of a **National Wholesale Druggists' Assn.** committee engaged in studying shipping cases sizes. Presented at a special meeting of the association at the Palmer House, Chicago, April 17–18, the report revealed that wastage of display materials by wholesalers ranged as high as 75%. The study disclosed that items packed in glass without suitable cartons or shelf packages were the "most troublesome and expensive to handle." Charles Luckman, executive vice-president of Lever Bros., Cambridge, Mass., scored manufacturers who are content to get back merely to pre-war packaging.

A detailed discussion of developments and future possibilities for shipment of perishable products by air is contained in a booklet, **"Air Transport of Agricultural Perishables,"** prepared by the U. S. Department of Agriculture's Working Group on Conversion of Marketing Facilities and Method of the Interbureau Committee on Postwar Programs. Known as Miscellaneous Publication No. 585, copies may be obtained on request to the Department of Agriculture, Washington, D. C.

Offices of the **Waxed Paper Institute, Inc.,** Chicago, Ill., have been moved to 38 S. Dearborn St.

Committee chairmen recently appointed by the **Wirebound Box Manufacturers Assn.,** Chicago, include T. I. Foster, T. R. Miller Mill Co., Brewton, Ala., coordinating committee; W. C. Embry, General Box Co., materials research committee; H. C. Bullard, Chicago Mill & Lumber Co., market research committee; George T. Walne, General Box Co., sales promotion committee; R. J. Byers, Chicago Mill & Lumber Co., design, specifications and quality committee; and D. F. Hahn, General Box Co., manufacturing equipment committee.

Detailed information on Dexter machinery for the graphic arts and allied industries is contained in a well-illustrated catalog recently issued by the **Dexter Folder Co.** Copies are available on request to the firm, 330 W. 42nd St., New York 18, N. Y.

Information about Bemis waterproof paperlined textile bags appears in a booklet entitled **"Seven Facts About Low-Cost Protective Packaging,"** recently issued by the **Bemis Bro. Bag Co.** Copies are available on request to the company, 408 Pine St., St. Louis 2, Mo.

Information on Oliver equipment for automatic wrapping, labeling and label imprinting is contained in an illustrated folder just published by the **Oliver Machinery Co.,** Grand Rapids, Mich. Copies are available on request to the company.

Applications for the various types of surface pyrometers manufactured by the **Cambridge Instrument Co., Inc.,** are explained and illustrated in Bulletin 194-SA, recently issued by that firm. Copies of the booklet are available on request to the company, 3131 Grand Central Terminal, New York 17, N. Y.

The QMC Subsistence Research and Development Laboratory has been redesignated the **Quartermaster Food and Container Institute for the Armed Forces.** Col. Charles S. Lawrence has been assigned as the Institute's commanding officer. Operations continue at 1849 W. Pershing Rd., Chicago.

Use of overhead chain conveyors to save time, space and handling costs is explained in an illustrated booklet entitled, **"Utilize the 'Air Rights' of Your Ceilings,"** published by the **Lamson Corp.** Copies available on request to the firm, Syracuse 1, N. Y.

"Five Formulas for Improved Packaging," and **"Vuepak for Packaging and Fabricating,"** issued by **Monsanto Chemical Co.'s** plastics division, set forth the merchandising advantages of Vuepak visual packaging material. Copies may be obtained from the company at Springfield, Mass.

A continued shortage of **burlap** was predicted by Ferdinand H Rhoden, head of burlap purchases for **Chase Bag Co.,** Chicago, Ill., on his recent return from Calcutta. Mr. Rhoden expressed doubt that burlap importations can be expected to eliminate the current textile bag shortage in this country.

The **Label Manufacturers National Assn.** held its regular meeting in Atlantic City May 9–10. C. W. Browne, editor-in-chief of MODERN PACKAGING, was a guest speaker.

NEW PACIFIC COAST COVERAGE

MODERN PACKAGING *announces the establishment of a Pacific Coast Editorial Office at 427 W. Fifth St., Los Angeles, with* GEORGE DRAKE *in charge as Pacific Coast Editor. Mr. Drake has for several years covered various Pacific Coast industries for industrial publications and was editor of a leading magazine on the Coast prior to his association. He will now be in a position to give close attention to packaging activities in the area west of the Rocky Mountains—a growing sector of the packaging field.*

Package with a view

LET EASTMAN ACETATE SHEET GIVE CUSTOMERS A CLEAR VIEW OF YOUR PRODUCTS

PEOPLE like to see what they buy—and they tend to buy what they see . . . provided they see it clearly, attractively, at its most convincing best.

The sparkling optical clarity of Eastman Acetate Sheet gives your products every opportunity to show at their best. This material also protects them against handling, against dust and shopwear . . . insures that they *keep on* showing their best.

And Eastman Acetate Sheet is versatile. Its forming properties, toughness, dimensional stability, plus transparency, make it an invaluable answer to modern packaging problems. It can be drawn, beaded, creased, folded, crimped, stapled, or joined with either solvent or glue-type adhesives. Beautiful printed effects are readily obtained. Rolls or sheets can be supplied in three types—clear transparent, matte translucent, colored translucent.

You are invited to visit the modern Kodak Transparent Packaging Laboratory in Rochester, where Kodak technicians will demonstrate how Eastman Acetate Sheet can help you to show your products at their best. Write for an appointment.

Cellulose Products Sales Division
EASTMAN KODAK COMPANY, ROCHESTER 4, N. Y.

An informative Eastman Acetate Sheet folder giving essential fabricating data is yours on request.

Eastman Acetate Sheet

ATTRACTS • PROTECTS • SELLS

Kodak

U. S. patent digest

edited by H. A. Levey

This digest includes each month the more important patents which are of interest to those who are concerned with packaging materials. Copies of patents are available from the U. S. Patent Office, Washington, at ten cents each in currency, money order or certified check; postage stamps are not accepted.

Feeding Device, R. E. J. Nordquist (to American Can Co., New York, N. Y.). U. S. 2,395,497, Feb. 26. In a feeding device for container blanks, the combination of a rotatable member, a suction cup carried on said member for engaging a surface of a blank and for advancing the blank along a path of travel.

Carton, S. R. Howard (to Pneumatic Scale Corp., Ltd., Quincy, Mass.). U. S. 2,395,663, Feb. 26. As a new article of manufacture, a package comprising a carton filled and closed, said carton being made from a rectangular blank of board stock scored to provide body panels, end closing panels foldably connected to said body panels, and seam forming panels extending along the entire marginal edge of said blank capable of forming a continuous integral face to face seam along the top.

Liner for Adherent Rubber Surfaces and the Like, W. Kellgren & W. D. Hurd (to Minnesota Mining & Mfg. Co., St. Paul, Minn.). U. S. 2,395,668, Feb. 26. In a roll of double-coated pressure-sensitive adhesive tape, an interwound line of creped paper impregnated and coated on both sides with a fused and homogeneous non-bleeding composition comprised of medium-ethoxy cellulose and lesser proportions of hydrogenated castor oil wax and higher fatty acid.

Automatic Container Filler, N. E. Lauterbach (to Ritter Co., Inc., Rochester, N. Y.). U. S. 2,395,674, Feb. 26. An automatic container filler comprising a pair of levers, one of said levers being pivoted intermediate its ends and nearer one end than the other and having a container support mounted on its longer end, the other of said levers being pivoted adjacent one end with its other end connected with the shorter end of the first mentioned lever.

Laminated Sheet Pulp Container and Method of Forming Same, L. M. Wiley (one-third to J. T. Lett and one-third to R. B. Witey), Marion, Ind. U. S. 2,395,-703, Feb. 26. A method of forming a deep-drawn, seamless laminated wall container of substantial uniform wall thickness in transverse section and with an inner surface forming pulp layer, an outer surface forming pulp layer and an intermediate imperforate plastic layer there between comprising initially assembling two water and size absorbing pulp plies with a water repellent with pressure settable bonding plastic layer there between and co-extensive therewith.

Plastic Lipstick Holder, J. W. Anderson, Danbury, Conn. U. S. 2,395,709, Feb. 26. In a stick containing an expellant holder, the combination of a tubular casing shell having an end wall and a thin curved side wall of resilient material stiffened by said end wall in a region near the same and perforated by spaced neighboring elongated slots extending lengthwise of the shell, and equipped with stick-carrying plunger freely slidable in and lengthwise of said shell.

Expellant Holder with Telescopic Screw Core, J. W. Anderston, Newton, Conn. U. S. 2,395,710, Feb. 26. In an applicative container for holding, projecting and retracting a stick of dispensable substance, the combination of an external elongated casing shell having an open end, a plunger member including a straightly continous, axially extending tubular wall having a perimeter slidably fitting said shell at opposite axial end portion of said plunger.

Collapsible Bottle Carrier, B. Arnold, Laurel, Md. U. S. 2,395,711, Feb. 26. In a portable carrier for bottles, formed from a single blank of sheet material, comprising a handle consisting of four panels folded to lie in parallel relation, the inner two of said panels having respective end-wall flaps connected to side wall flaps and bottom wall flaps connected to respective side walls.

Straw and Milk Container Combination, M. L. Georgopoulos, Washington, D. C. U. S. 2,395,734, Feb. 26. The combination with a conventional waxed cardboard milk container, of a straw secured directly to the exterior of the container adjacent the top rim of the container, said straw being of a length equal to the width of the side of the container.

Method of Making Containers, J. G. O'Neill & L. G. Zesbaugh (to C. Weinhagen, Jr., St. Paul, Minn.). U. S. 2,395,754, Feb. 26. The method of forming a container which consists in providing a rigid member having an opening therethrough, placing said member upon a mandrel, rotating said mandrel to wind a sheet of flexible material about said member with the edges of said sheet respectively spaced from the sides of said ring to form a tube with said ring spaced from both ends thereof, placing a bottom in one end of said tube and folding the end of said tube inwardly at the outer side of said bottom.

Weighing Apparatus, W. Honegger, Zurich, Switzerland. U. S. 2,395,784, Feb. 26. A weighing apparatus including in combination a support, a reciprocating load carrier movable in a plane inclined to the support, a driving roll, a connection between the load carrier and the driving roll whereby the driving roll is adapted to be oscillated by and through the movements of the load carrier.

Method of Filling Confined Spaces Associated with Electric Apparatus, E. C. Lee (to International Standard Electric Corp., New York, N. Y.). U. S. 2,395,886, Mar. 5. Method of filling spaces within a container associated with electrical apparatus with insulating material, which comprises filling the said spaces with a fluid solvent for an insulating extrudable material, and then displacing the said solvent by the said extrudable material.

Yarn Package, A. Lodge (to American Viscose Corp., Wilmington, Del.). U. S. 2,395,891, Mar. 5. The combination of a yarn carrier, a yarn package and transfer and waste tails on the carrier, said transfer and waste tails being spaced from the yarn package and from each other.

Slitter Mechanism for Printing Presses, O. R. Wolf (to Tribune Co., Chicago, Ill.). U. S. 2,395,950, Mar. 5. A plurality of slitter mechanisms for slitting webs in newspaper or like printing pressing.

Novelty Carton, S. Isenberg, New York (one-third to N. Shapiro, Philadelphia, Pa.). U. S. 2,396,010, Mar. 5. A blank for a novelty carton consisting of portions delineated by weakened or die cut lines, said portions comprising aligned side wall panels, one of the side wall panels bearing an ornamental design and being continued beyond the top margins of the other panel to include an ornamental design complementing that on the wall portion of said panel.

Collapsible Tube Holder, E. L. Lahtinen, Minneapolis, Minn. U. S. 2,396,016 Mar. 5. A holder for supporting a collapsible tube with its closure cap removed from the mouth of the tube, said holder comprising a housing provided with an upper wall and an elastic bottom wall having a central opening therein adapted to receive one end of the tube.

Mechanism for Removing Blanks from Magazines and Transferring the Blanks to Mandrels, J. Cutler, Mattapan, Mass. U. S. 2,396,988, Mar. 19. In a jacket-forming machine wherein is provided a magazine for stacked blanks and a distant mandrel to which blanks are transferred, the improvement which includes: a supporting frame; a carriage horizontally reciprocatably mounted on said frame; a vertically movable blank transferring member mounted on and carried by said carriage and positioned to lie directly under and spaced from said mandrel when the carriage is at the other extremity of its path of movement, and means for advancing and retracting said carriage, and lowering and retracting means for transferring while the carriage is retracted.

Capsule, J. O. Scherer (to Gelatin Products Corp., Detroit, Mich.). U. S. 2,397,-051, Mar. 19. A capsule having a shell formed of two complementary half sections joined together along a seam line, said capsule having two integrally formed projections lying in the plane of the seam line extending from the sides of the capsule sufficient distances to be grasped by the fingers of the hands and pulled away from one another.

All Hands agree on BEETLE PLASTIC

The lustrous color of Beetle* plastic is the feature that gives this Cutex kit its distinctive sales appeal. But equally important in keeping customers satisfied with their purchase is its satin-smooth texture—a delight for feminine hands to touch.

Beetle plastic is a combination of the practical and the ideal for such packaging purposes. Chemically inert, dimensionally stable, highly resistant to impact, abrasion and wear, it meets all the requirements for service as well as appearance—at low production costs.

Do you have ideas for a package in which all of these advantages are needed? We are always ready to give you a hand in working out your design and molding problems.

*Reg. U. S. Pat. Off.

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Plastics Division
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Cyanamid Plastics
BEETLE • MELMAC • MELURAC
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WIDE COLOR VARIETY OF BEETLE PLASTIC provides a range of choices, increases attention value, multiplies sales at no additional expense.

Cutex kit made by Northam Warren Corporation

Hoodcap, K. R. Allen (to American Seal-Kap Corp., Wilmington, Del.). U. S. 2,396,225, Mar. 12. A hood cap for containers formed from a substantially circular blank and comprising a central diaphragm and a pleated skirt extending downwardly therefrom around the outside of the container, a band of adhesive disposed around the peripheral portion of the outer surface only of the skirt, said skirt having overlapped portions folded under about vertical fold lines to form concealed pleats with the portions of the adhesive band on the contacting surfaces of the pleats.

Filler Cap and Relief Vent, V. R. Abrams, Detroit, Mich. U. S. 2,396,233, Mar. 12. In combination with a filler neck, a filler cap and relief vent comprising a ring member adapted for insertion in said neck and to seat thereon, a hollow body supported in and normally seated on said member and having an axial vent opening adjacent the upper end thereof.

Continuous Feeder for Cardboard, F. R. Belluche (to The Christensen Machine Co., Racine, Wis.). U. S. 2,396,240, Mar. 12. In a sheet feeder of the continuous type wherein sheets are fed in a bank to predetermined feed-off position, the combination of: means for advancing a bank of sheets toward the feed-off position; a jogger in the path of the sheets for intermittently engaging the front edges of the foremost sheets of the bank and jogging them into a pile at the feed-off position, mechanism for controlling the operation of the bank advancing means including a feeler adapted to feel for the height of the pile.

Reclosable Carton, G. Yungblut (to The Gardner-Richardson Co., Middletown, Ohio). U. S. 2,396,310, Mar. 12. A carton blank for the purpose of having in articulation enclosing walls and a glue flap, means at the wall ends to form end closures, a line of demarcation extending across the said walls inwardly from end portions thereof approximatey the width of one of the walls, said line of demarcation in a pair of said walls being a score line and being a line of weakening in another pair of said walls.

Bottle and Closure Therefor, G. L. Moore, Chicago, Ill. U. S. 2,396,237, Mar. 12. A bottle having a neck terminating in an outwardly projecting bead and having an inwardly facing annular groove adjacent to the end of the neck with its upper wall facing downwardly and inwardly to form an annular abutment, a closure comprising a cap formed of paper, having a central concavo-convex portion with an outwardly extending curved flange fitting closely over said bead.

Article Form of Laminated Sheet Material, I. L. Wilcox (to Oswego Falls Corp., Fulton, N. Y.). U. S. 2,396,358, Mar. 12. A hood type bottle cap having a skirt portion adapted to be contracted about the neck of the bottle comprising inner and outer layers of sheet material, the marginal portion of the cap being scored to define overlapping pleat portions when the skirt portion of the cap is contracted about the neck of the bottle, having plastic adhesive interposed between said layers.

Carton, V. R. Pantalone (to National Folding Box Co., New Haven, Conn.). U. S. 2,397,041, Mar. 19. A carton formed from a single blank of paperboard material including side wall sections connected together to provide a generally tubular construction, and a pair of end sections hingedly connected to opposite ends of one wall section, and a spacing member hingedly connected to each of said end sections.

Hydraulically Controlled Baler, E. B. Nolt (to New Holland Machine Co., New Holland, Pa.). U. S. 2,396,720, Mar. 19. A hydraulically controlled baler comprising a hydraulic operating cylinder, a piston reciprocative in said cylinder, a hay baling plunger connected with said piston, a hay baling chamber in which said hay baling plunger is arranged to reciprocate, means for successively introducing hay into said hay baling chamber for successive compacting operations thereon.

Closure for High-Pressure Vessels, D. P. Meigs (to American Instrument Co., Silver Spring, Md.). U. S. 2,396,469, Mar. 12. A closure for high pressure vessels comprising a receptacle having a recessed opening constituting an annular shoulder seat for receiving a closure head therein in sealing engagement with the annular shoulder seat, tapered screw threads formed internally adjacent the end of said receptacle, a thrust bearing sleeve having tapered screw threads thereon co-acting with the taper screw threads on said receptacle.

Bottle Carrier, H. K. Powell (to Morris Paper Mills, Chicago, Ill.). U. S. 2,396,473, Mar. 12. A knock-down bottle carrier adapted to be assembled by the user comprising a body member formed of paperboard or the like and having a bottom panel and side panels extending upwardly from opposite side margins thereof, each of said side panels having a connecting flap extending along its upper end from a fold crease which runs transversely of the side panel, said side panels being connected to each other at their upper ends.

Envelope and Opener Combined, M. Velazquez, Mobile, Ala. U. S. 2,396,543, Mar. 12. In a combination envelope and opener a receptacle portion, an independent gummed flap, a rectangular strip of cellophane of a length corresponding to the adjacent edge portions of the flap and receptacle portions and having its opposite longitudinal edges attached, respectively, to said flap and receptacle portions, a second narrower strip of cellophane constituting a tear-tape, said tear-tape being superimposed against, and attached to, the median portion of said cellophane strip on the inside of said strip, and said tear-tape being of a tougher texture than said strip and formed at one end with a finger tab, whereby to readily disrupt and sever the strip from end to end to thus wholly separate the flap from the receptacle portion.

Package, C. E. Gardner (to Wingfoot Corp., Akron, Ohio). U. S. 2,396,565, Mar. 12. A collapsed, two-ply gusseted bag, the outer ply of which is composed of paper and the inner ply of which is composed of an impervious heat-sealable, synthetic material; the bottom of bag being made up of synthetic material which is closed in a seam formed with the inner surfaces of the material brought together, and four uncreased rectangular flaps which are extensions of the paper which constitutes the outer ply of the sides of the bag, said flaps being folded toward the middle, along the lines which define the bottoms of said walls.

Conveyor for Cylindrical Articles, L. Marzocchi, Milan, Italy (vested in the Alien Property Custodian). U. S. 2,396,589, Mar. 12. A conveyer for cylindrical objects comprising a plurality of elongated pocket members arranged in parallel spaced relation and extending transversely with respect to the travel of the conveyer, each pocket having a perforate bottom curved only in longitudinal cross-section and adapted to accommodate a single cylindrical object.

Bottle Case, R. H. Brady, St. Louis, and E. O. Birkner, Pasadena Hills, Mo. (one-third to H. C. Reagen, one-sixth to M. V. Brade of St. Louis, and one-sixth to G. M. Brikner, Pasadena Hills, Mo.). U. S. 2,396,770, Mar. 19. In a bottle-case, a box-like shell including connected side and end walls, a bar, a pair of strips secured to and depending from the side walls, said strips being marginally flanged at their ends for relatively engaging said bar.

Cheese Bandage, R. C. Whitman (to The Kendall Company, Boston, Mass.). U. S. 2,396,905, Mar. 19. For use in the manufacture of cheese, a mold inhibiting two-ply woven textile cheese bandage consisting of a section woven from cotton yarn in the order of 20's to 50's in weight, said section being composed of two fabric plies of loose mesh weave having a count in the order of 15 to 35 per inch in the lengthwise direction and 30 to 50 in the transverse.

Cosmetic Case, M. M. Slaton, Burbank & M. M. Crowe, Los Angeles, Calif. U. S. 2,396,932, Mar. 12. A combination multiple service compact including a plurality of respectively moving parts comprising a substantially cylindrical container having a lower and an upper chamber therein and a dividing partition, a hollow lipstick carrying cap threadable engaging the outer end of one of said chambers, a second smaller cylindrical container having a chamber therein in axial alignment with the first forming a cap for the other of said chambers in the first container.

Box, E. J. Bonville (to Robertson Paper Box Co., Inc., Montville, Conn.). U. S. 2,396,150, Mar. 5. A box consisting of an inner box comprising four panels, an outer box comprising four panels and folded about the inner box to enclose it.

Collapsible Box, H. W. Finn (to Consolidated Paper Co., Monroe, Mich.). U. S. 2,396,168, Mar. 5. A collapsible box comprising in a single strip four directly-hinged-together side portions for a front and back alternated with two end portions with a connecting flap on the free end of one of the portions adhesively secured to the adjacent free end of the strip to provide an overlapping portion to form bounds for a box top and bottom.

DAVISON DEHYDRATED PACKAGING

Fungus growth that may attack leather (greatly magnified)

eliminates mildew and mold

Textiles, paper and leather . . . and even insulation on electrical assemblies . . . are all subject to moisture damage in transit and storage. Mildew and mold greatly lessen the sales appeal of an item and may completely ruin a shipment.

Davison Dehydrated Packaging, using Protek-Sorb* silica gel as the desiccant, eliminates the cause of this damage . . . mildew and mold cannot start in a safe, dry atmosphere such as is found within a Davison engineered package. This protection is economical and shelf attention is enhanced. Consult Davison.

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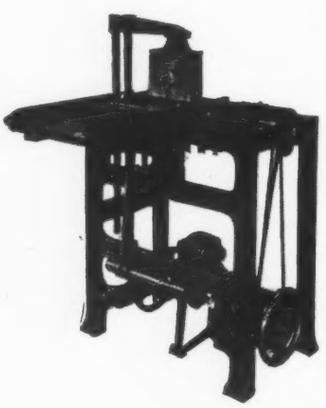
CARTON PACKAGING Can Be A "One Operator Job"

Many plants have simplified their carton packaging problem by letting PETERS economical packaging machines, with one operator, do the work of many persons.

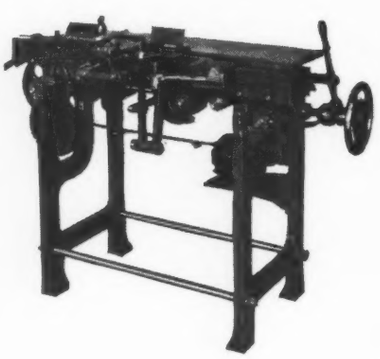
The result is lower cost production and greater overall profit.

Why not send us samples of the various sizes of cartons you are now using? We will be glad to make recommendations for your specific needs.

This PETERS JUNIOR CARTON FORMING & LINING MACHINE sets up 35–40 cartons per minute, requiring only one operator. After the cartons are set up, they drop onto a conveyor where they are carried to be filled. If several size cartons are desired to be handled, machine can be made adjustable.



This PETERS JUNIOR CARTON FOLDING & CLOSING MACHINE closes 35–40 cartons per minute, requiring no operator. After cartons are filled, they enter machine on conveyor and are automatically closed. Can also be made adjustable to handle several different size cartons.



PETERS MACHINERY COMPANY
GENERAL OFFICE AND FACTORY
4700 RAVENSWOOD AVENUE, CHICAGO, ILL.

Grower Packaging . . .

(*Continued from page 109*) mercial venture, Mr. Phillips stresses the point that the Association is open-minded in respect to all of the main issues at stake. Everything that has been accomplished to date in the pre-packaging field they consider to be purely exploratory. Materials, methods, the psychology of the sizes of packages—even pre-packaging at the point of origin—are, according to them, all open to question. However, they are willing to spend money to get the right answers.

Their pre-packaged fruits and vegetables will be marketed through regular distribution and retailing channels. Nevertheless, great stress will be placed on maintaining, through continuous refrigeration, the original quality of the product all the way to the consumer's market basket, and they will insist that both the wholesalers and retailers who handle their products cooperate 100% to that end. Like other informed people in this field, they are convinced that the package alone is not enough to insure maintenance of high quality in fresh produce and they are apprehensive of the damage to the consumer market which is resulting from the increasing practice of packaging without accompanying refrigeration.

Aside from the quality and economy of properly handled pre-packaged fruits and vegetables, the outstanding feature is their adaptability to self-service consumer sale. Some idea of what self-service has done to and for the American housewife can be gained from the fact that less than 25% of our approximately 425,000 retail outlets do more than 75% of the retail food business. It has been estimated that about nine billion dollars of the retail store business is handled by supermarkets, self-service stores and stores offering some form of self-service.

Pre-packaged produce brings the refrigerated open-top self-service case into sharp focus. One authority predicts that within a three-year period at least 25% of the national output of fresh produce will be pre-packaged and sold through self-service stores equipped with such modern cases.

On the assumption that even one refrigerated case can put a store in the self-service field, it is not difficult to recognize the opportunity that pre-packaged fruits and vegetables offers to the independent—even the little fellow. A great decrease in loss through trimming and spoilage; increases in unit sales to the individual consumer; a big increase in impulse buying inspired by the attractive display of tastefully packaged merchandise—all are proved results of the refrigerated case. In cash register terms it has been shown that, depending upon merchandising ability and the location of the store, from $300 to $700 worth of garden vegetables per week can be sold from each self-service refrigerated case.

The exacting requirements of merchandising fresh produce pre-packaged at the grower-shipper level constitute a challenge to every phase of the produce indus-

SPOOLS

The patented R. C. Can method of attaching the heads to the core of the spool makes the spool roll truer when winding or unwinding from a dispenser.

The R. C. Can Company manufacturers a complete line of fibre spools for ribbons, tapes (including pressure sensitive tapes) bandages, etc. These spools may be of an all fibre construction or of fibre construction with metal cores at each end to assure easy rolling on the dispenser. Your trademark or other copy may be printed on the ends.

If it's spools, fibre cans or cores you need, see your nearest R. C. Can Company representative.

R.C. CAN COMPANY

Manufacturers of fibre cans, tubes, spools and cores

Head Office: St. Louis, Mo.

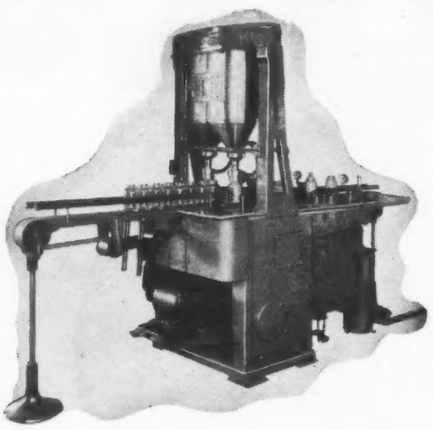
Branch Factories: Arlington, Texas; Rittman, Ohio; and Kansas City, Mo.

Sales Offices: Minneapolis, New Orleans, Atlanta, Memphis, Milwaukee, Louisville, New York, Pittsburgh, Denver and Los Angeles.

R.C. CAN CO. THE STAMP OF QUALITY ST. LOUIS, MO.

IF YOU PACK . . .

POWDERS IN JARS



THE S&S HG-84 . . .

WILL PACK THEM FOR YOU

Yes, sir, and you get a *dustless* fill and a tight pack. The Stokes and Smith HG-84 Duplex Heavy Duty Filling Machine answers all the questions for any packer who merchandises powders in jars.

The secret is the "Auger-Vac," or auger-vacuum system, with which the machine is equipped. Combining the speed and accuracy of the auger feed with the dustless feed of the vacuum method, the efficiency of this system has been proven by leading packers throughout the country.

The HG-84 with "Auger-Vac" is available in various types. It fills not only jars, but cans or other air-tight containers with pulverized coffee, powdered milk, ice cream mix, malted milk, cocoa or numerous similar products, in the amounts desired.

"Speeds to suit your needs:" 15—25—50—100 per minute; "Auger-Vac" method may be used also on other S & S Single Unit Filling Machines. Full particulars on request.

WE REGRET, that we can't ship you a machine as soon as we would like; it's impossible to build them fast enough to keep up with the demand . . . but there'll come a day, we hope, when orders can be filled reasonably soon after receipt.

STOKES & SMITH Co

Frankford, Philadelphia 24, U. S. A.

FILLING . PACKAGING . WRAPPING MACHINES

Speeds to suit your needs: 15—30—60—120 per minute

"Better machines for better packages"

try. Wasteful methods, costly delays and damaging speculative practices will give way to streamlined, highly coordinated teamwork. Whatever the necessary changes may be, they seem destined to become realities in the face of the determined efforts of growers and retailers alike to present to the consumer fruits and vegetables as fresh as the day they were picked.

New plastic films . . .

(*Continued from page 144*) plotted against $1/T$, a straight line results. This is done in Figs. 3 and 4, where the water-vapor transfer values are plotted on a log scale and the temperature values, while stated in degrees Fahrenheit, are spread according to $1/T$. The result presented for polystyrene, Cryovac, Pliofilm and Saran in Figs. 3 and 4 were obtained on commercial films. The samples of vinylite VYNW and Geon 101 were laboratory-prepared films and contained no plasticizer. The results shown for polyethylene (Sample 1) were obtained on one of the earlier experimental samples and present commercial production samples are considerably better than shown by these results, as indicated by Sample 2. All results are given on the basis of film .001 in. thick.

Fig. 3 shows the effect of temperature on the inherent water-vapor transmitting characteristics of the films. In this plot, the water-vapor transfer rate is divided by the vapor pressure across the film in order to eliminate this variable and to show the effect of temperature on the inherent water-vapor transmitting characteristics. It will be noted that polystyrene shows no temperature dependence; this is the only film tested which shows this characteristic. The other films show varying changes in water-vapor transfer rate with change in temperature. The rubber Cryovac film above 32 deg. F. has poor resistance to water-vapor passage, but at this temperature it crystallizes and becomes much more resistant to water-vapor passage at lower temperature.

Fig. 4 shows the effect of temperature on the actual water-vapor transfer rate. These curves take into account the effect of temperature both on the vapor pressure across the film and on the inherent water-vapor transmitting characteristics. It is seen from these curves that many of the films have excellent resistance to the passage of water vapor at sub-freezing temperature. The solid lines of Figs. 3 and 4 are plots of actual data but the dotted lines are extrapolated. It is believed that at low temperatures the film materials will be at least as resistant to transfer of water vapor as indicated by the dotted lines, unless the film material ruptures at the low temperatures.

References

1. Doty, P. M., Aiken, W. H., and Mark, H., *Industrial and Engineering Chemistry, Analytical Ed., 16*, 686 (1944).
2. Aiken, W. H., Doty, P. M., and Mark, H., "Water-Vapor Permeability," MODERN PACKAGING, Aug. 1945, p. 145.
3. Doty, P. M., Aiken, W. H., and Mark, H., "The Temperature Dependence of Water-Vapor Permeability" (to appear in *Industrial and Engineering Chemistry* in the near future).

is your product

SALES MINDED?

In the drug and chemical business these days they are doing a lot of talking about germicides, penicillin, the sulfa drugs, plasma substitutes and ancino acid products . . . yes, and from pharmaceuticals to petroleums they are talking about the sales influence of set-up boxes. No other container offers so much in sturdy, long-wearing quality and outright sales appeal.

This billion and a half dollar industry uses more set-up boxes than any other type of container. Set-up boxes are no cure-all for packaging ills but practically every nationally sold drug and chemical uses set-up boxes as the ideal packaging medium. Your product will be more sales minded with a set-up box. Write or call your nearest paper box manufacturer for survey (Dept. 43) "Drug and Chemical Industries".

NATIONAL PAPER BOX MANUFACTURERS *Association*

AND COOPERATING SUPPLIERS

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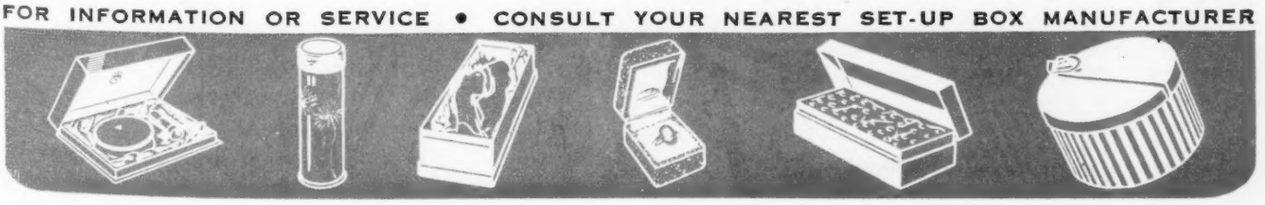
FOR INFORMATION OR SERVICE • CONSULT YOUR NEAREST SET-UP BOX MANUFACTURER

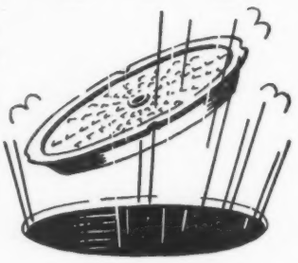


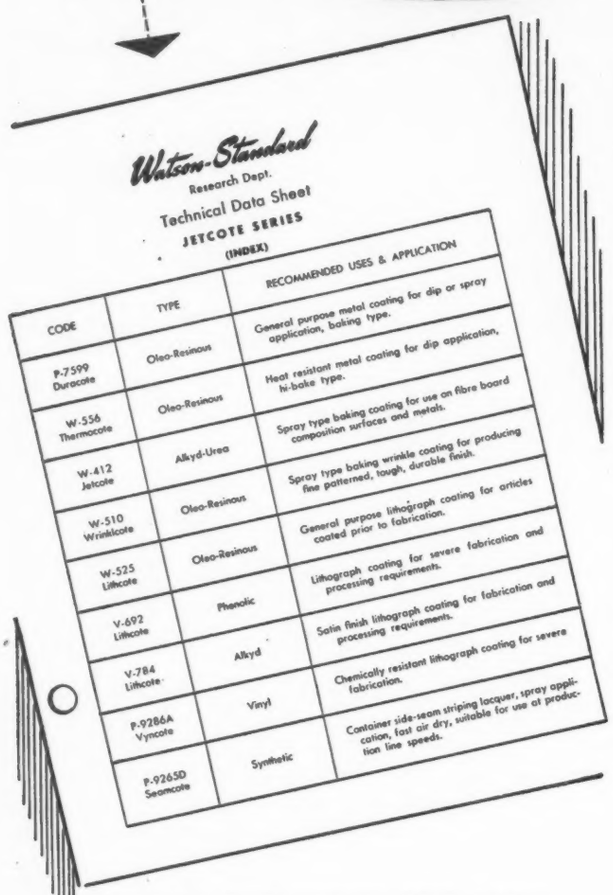
The Lid's Off!

JETCOTE

Series of BLACK Protective Coatings

Now Available





Watson-Standard
Research Dept.
Technical Data Sheet
JETCOTE SERIES
(INDEX)

CODE	TYPE	RECOMMENDED USES & APPLICATION
P-7599 Duracote	Oleo-Resinous	General purpose metal coating for dip or spray application, baking type.
W-556 Thermocote	Oleo-Resinous	Heat resistant metal coating for dip application, hi-bake type.
W-412 Jetcote	Alkyd-Urea	Spray type baking coating for use on fibre board composition surfaces and metals.
W-510 Wrinklcote	Oleo-Resinous	Spray type baking wrinkle coating for producing fine patterned, tough, durable finish.
W-525 Lithcote	Oleo-Resinous	General purpose lithograph coating for articles coated prior to fabrication.
V-692 Lithcote	Phenolic	Lithograph coating for severe fabrication and processing requirements.
V-784 Lithcote	Alkyd	Satin finish lithograph coating for fabrication and processing requirements.
P-9286A Vyncote	Vinyl	Chemically resistant lithograph coating for severe fabrication.
P-9265D Seamcote	Synthetic	Container side-seam striping lacquer, spray application, fast air dry, suitable for use at production line speeds.

Watson-Standard's post-war black finishes, incorporating the latest war-proved scientific advances in the field of organic protective coatings, are now available.

More attractive and more durable black finishes on steel, tinplates and many other surfaces are now made possible with this versatile series. Write today for a copy of the Jetcote Technical Data Folder.

THE WATSON-STANDARD CO.

Manufacturers of
PAINTS • VARNISHES • INDUSTRIAL FINISHES AND LITHOGRAPH COATINGS

TOUGH JOB HEADQUARTERS
Rx Prescription Finishes
Give us your metal coating problem. We guarantee you an answer based on your conditions and not just a standardized formula.

FACTORY AND GENERAL OFFICES: PITTSBURGH, PA. • WAREHOUSES: BOSTON, BUFFALO, DETROIT, NEW YORK

Sunglasses . . .

(*Continued from page 113*) the one that is sold from stock in the back of the unit.

Each of the three lines has its own box—a maroon background for the women's glasses, a suntan brown background for "Eye Style" for men and a wood grain background for "Town and Country." On each box the name Grantly is prominently displayed and is repeated on the paper tape used across each box as shown in the illustration to keep glasses and pocket case in place, when open for display. Die-cut flaps in the bottom of each box hold the glasses securely in the box.

There are three different display units for the three lines. The one for women's glasses shows a beach scene with a girl in the foreground. The counter display for the men's glasses shows a yachtsman at the wheel. The "Town and Country" box-cover design is used as the display theme for the general line of glasses. All pictorializations were done by leading fashion artists.

By means of the three merchandising units, every store may have its sunglass department. The special merchandisers for men's and women's glasses, also offer opportunity for display in strategic locations throughout a department store, say, with women's beach wear, or in a men's wear department featuring sports wear.

Although popular-priced sunglass sales have been concentrated heretofore in drug stores, the new merchandising plan comprising the packaged line and counter units indicates an enlargement of the sales program to include department stores and other outlets.

CREDITS: *Design and merchandising program, Grey Advertising Co., New York. Folding boxes and counter merchandise units, J. and P. B. Myers, Inc., New York.*

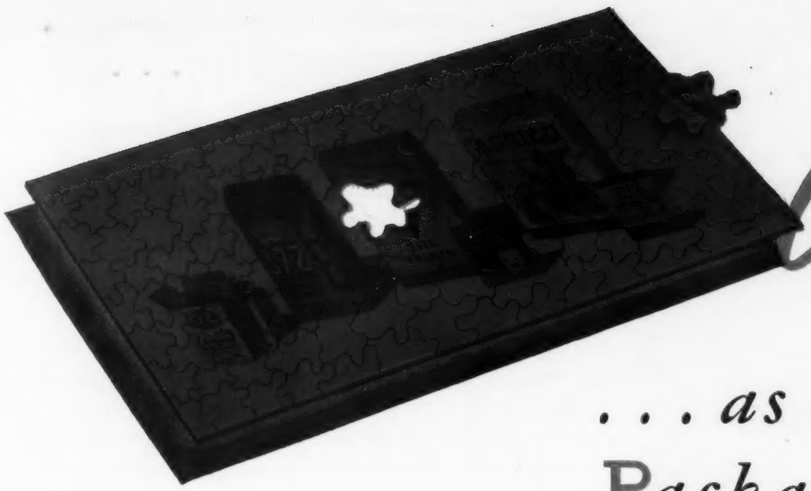
Packaging of bearings . . .

(*Continued from page 129*) controlled humidity conditions with and without moistureproof coatings.

The packaging requirements for some finer precision bearings includes covering with wax-coated cloth, then wax dipping (Fig. 14). Materials of the type produced by Dearborn Chemical are used. Government specifications for many types including packaging in a metal foil heat-sealed bag (Fig. 15) which, in turn, is enclosed in another vapor-, moisture-proof bag. An aluminum foil adaptable to heat sealing is used in some plants.

As the war ended, Governmental agencies were drawing up quite detailed specifications and suggesting standardization of practices in packaging and shipment of these "tremendous trifles," destined for military, air and naval use. These studies have not yet been completed and codified. For shipments to the armed services, Goverment specifications JAN-197 apply.

Meanwhile, the anti-friction bearing industry takes pride in its final assembly, testing and packaging record; especially in the high-precision field of aviation. It reports no bearings failures in planes at any time.



Complete

. . . as in Betner Packaging Service

All parts present. Nothing's missing from the packaging-service picture on view at Betner.

At your service, all or part: Men who know the service conditions a bag must meet; artists gifted at making a bag an indoor billboard; printing presses; bag-making equipment.

Plus, now, Benco bag-loading-and-sealing machinery, installed by Betner in *your* plant. The latest Betner service, the latest in "load-and-seal."

Inquiries invited—by mail, phone or wire. No obligation, naturally; mighty glad to have 'em.

Benj C Betner Co DEVON, PA.

BENJ C BETNER CO OF CALIFORNIA, LOS ANGELES, CAL.

Like a breath of Spring, these modern plastic containers can give new life to your product and make sales grow.

Light as a feather, yet strong, rigid, unbreakable. LUSTEROID protects as it displays through its crystal-clear walls. It's economical, too, because it can be printed and thus save labeling costs. Its light weight reduces packing and shipping expense.

All colors of the rainbow . . . clear or opaque. Sizes from ¼" to 1¼" in diameter. Lengths up to 6". Cork, slip-on or screw-cap closures. Write for details.

LUSTEROID CONTAINER CO., Inc.
Formerly Lusteroid Division of Sillcocks-Miller Company

Office and Factory
10 W. PARKER AVENUE, MAPLEWOOD, N. J.
MAILING ADDRESS: SOUTH ORANGE, N. J.

Gas permeability . . .

(*Continued from page 149*) erature on permeability was not studied with most of the sheets. In the case of Parafilm it was found that increasing the temperature from 16 deg. C. to 32 deg. C. approximately tripled the permeability to carbon dioxide. In general it was found that the permeability of materials to carbon dioxide was higher than the permeability to oxygen.

The effect of carrying out the permeability test with a slightly higher total pressure on the test gas side to reveal pore type permeation is illustrated by the data in Table II. Sulphite paper and parchment have considerable porosity as indicated by the marked increase in permeation rate when the conditions are changed from isostatic to slightly higher total pressure on the test gas side. Aluminum foil, however, does not show this effect, except in the thinner gauge (0.0005 in.), although pin holes could be detected in some samples of all gauges tested when examined against an enclosed light source in a totally darkened room. The results show that pore type permeation is markedly reduced or eliminated when, for example, the sulphite paper is coated with a continuous film of wax or the aluminum foil is laminated to paper with wax.

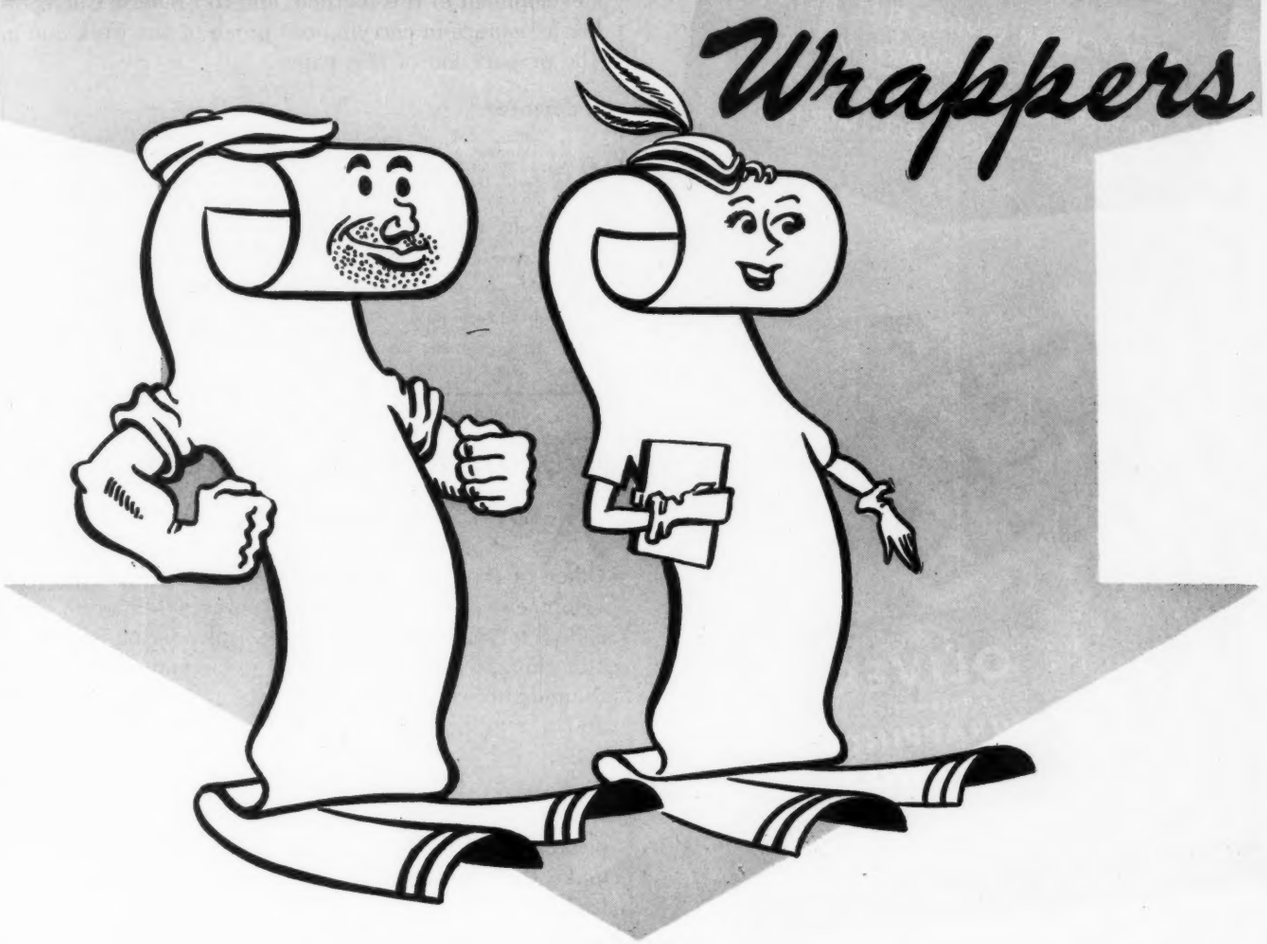
The nitrogen permeability of several different types of sheets is given in Table III. In general, it has been found that the nitrogen permeability of most sheets is slightly lower than the oxygen permeability.

The tremendous difference in the gas permeability of different types of sheet materials is illustrated by the tabulated data. The specific permeabilities of rubber and dry polyvinyl alcohol to carbon dioxide, for example, show a ratio of at least 360,000 to one. Care must be exercised in comparing gas permeability results determined by various methods which have been published by different investigators. The test conditions used are frequently different and in some cases not completely defined. Furthermore, different test methods might not be expected to yield identical results. Because of the wide variations in different samples of the same material, the only reliable means of comparing different permeability methods would be to make determinations with each method on the same test specimens using the same conditions of temperature and relative humidity.

The permeability method here described has been considered for the determination of water-vapor permeability also. It should be particularly well adapted for determining the water-vapor transmission rate between various relative humidity conditions. The large test areas which it makes possible might also be advantageous in determining water-vapor transmission rates at low temperatures, which are of importance in frozen food packaging. A few preliminary tests indicate that the method is applicable to the determination of water-vapor permeability but would

HI-BINDER

Wrappers



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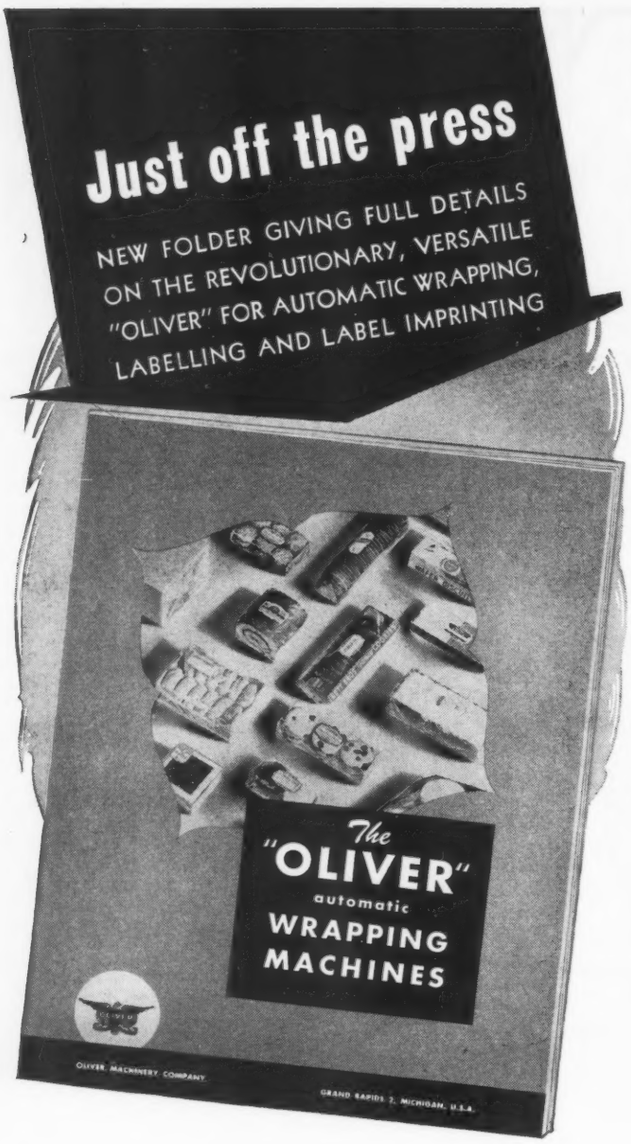
SPECIALISTS IN WRAPPER PROBLEMS
Prompt Delivery

Rugged and attractive! Tough enough to withstand rough handling, moisture, heat or cold. HI-BINDER is an eye-appealing packaging material.

HI-BINDER—coated, impregnated or laminated; film, foil, cloth or paper—helps you dress up your merchandise in an attractive package. Available in a wide variety of colors and styles. HI-BINDER retains flavor, aroma and freshness. A perfect match for your product.

THE CENTRAL OHIO PAPER CO.
226 North Fifth Street Columbus 16, Ohio
Also in Detroit, Cleveland, Pittsburgh, Dayton, Indianapolis, Toledo, Charleston


Just off the press
NEW FOLDER GIVING FULL DETAILS ON THE REVOLUTIONARY, VERSATILE "OLIVER" FOR AUTOMATIC WRAPPING, LABELLING AND LABEL IMPRINTING
The "OLIVER" automatic WRAPPING MACHINES
OLIVER MACHINERY COMPANY
GRAND RAPIDS 2, MICHIGAN, U.S.A.

This folder contains photographs and diagrams of the machines and their features, and the range and variety of packages they handle. It gives you the latest information on automatic packaging. It tells about the automatic Cardboard Folder and Feeder, the automatic "Oliver" Roll-Type Labelling System, and the Label Imprinter. Perhaps your business needs this money-saving equipment. When writing, if you have some special problem, tell us about it.

Ask for Folder No. MP-799

OLIVER MACHINERY COMPANY

Packaging Division Grand Rapids 2, Mich.

have to be studied further to determine how such results correlate with values obtained by other methods.

Acknowledgment

The author wishes to express his appreciation to George Brabender for his helpful suggestions in the development of this method, and to Frederic Cherepow for assistance in carrying out much of the work and in the preparation of this paper.

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German plastic packaging

A survey of the German plastics industry recently completed by a technical team representing the Office of the Quartermaster General disclosed the development of an unplasticized polyvinyl chloride film, called Luvitherm, produced by calendering and hot-stretching, which was said by the Germans to be equal to moistureproof cellophane in water impermeability and which they have reported to be better mechanically.

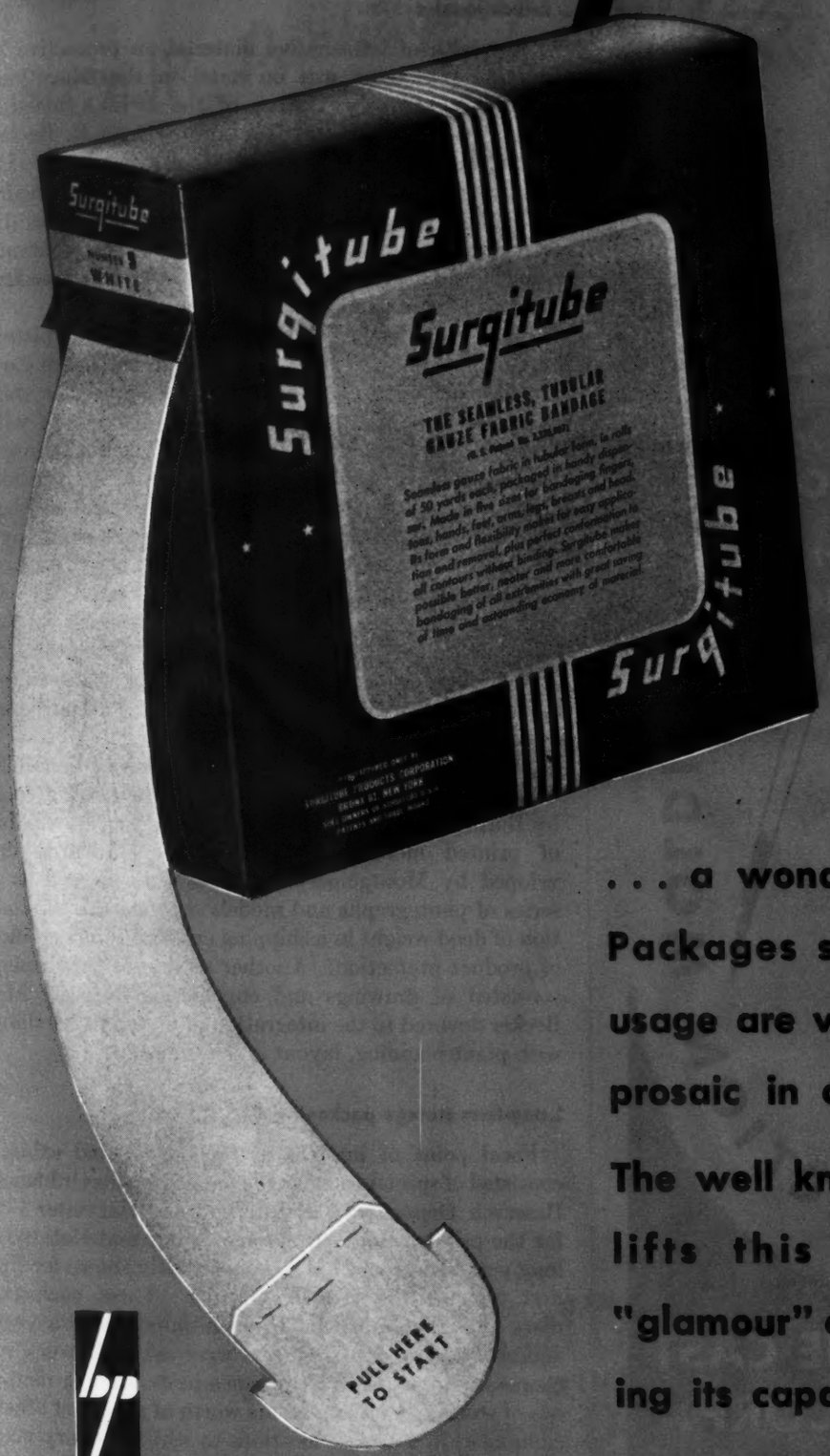
It is reported that the film can be heat-sealed and that it is good down to −80 deg. C. for rapid freezing packaging of foods. Absence of plasticizer is said to make the film odorless, tasteless and completely nontoxic.

The same film was used by the canning industry as a laminated inside coating for black iron cans, and it was reported that after three years' testing the coating was found to be better than tin for resistance to acid fruits, milk and pickles.

The Germans also were found to be using an interesting plastic dip-coating for preservation of bread and cheese. Bread coated with a 50% water emulsion of polyvinyl acetate containing various proportions of chalk, talc and lithopone showed only slight signs of interior mold growth after 8 months. Fresh bread was dipped in the vinyl emulsion, dried, and redipped; the bread was then sterilized by heating to 140 deg. C. for a half hour. Cheese has also been preserved, according to the Germans, by dipping in this polyvinyl acetate emulsion.

Luvitherm is described in the report "German Plastic Practices," by DeBell, Goggin and Gloor, available from the Office of the Publication Board, Department of Commerce. The plastic dip-coating for foods is described in Report No. 315, "French and Belgian Explosives Establishments," available from the same source.

Beauty and Protection . . .



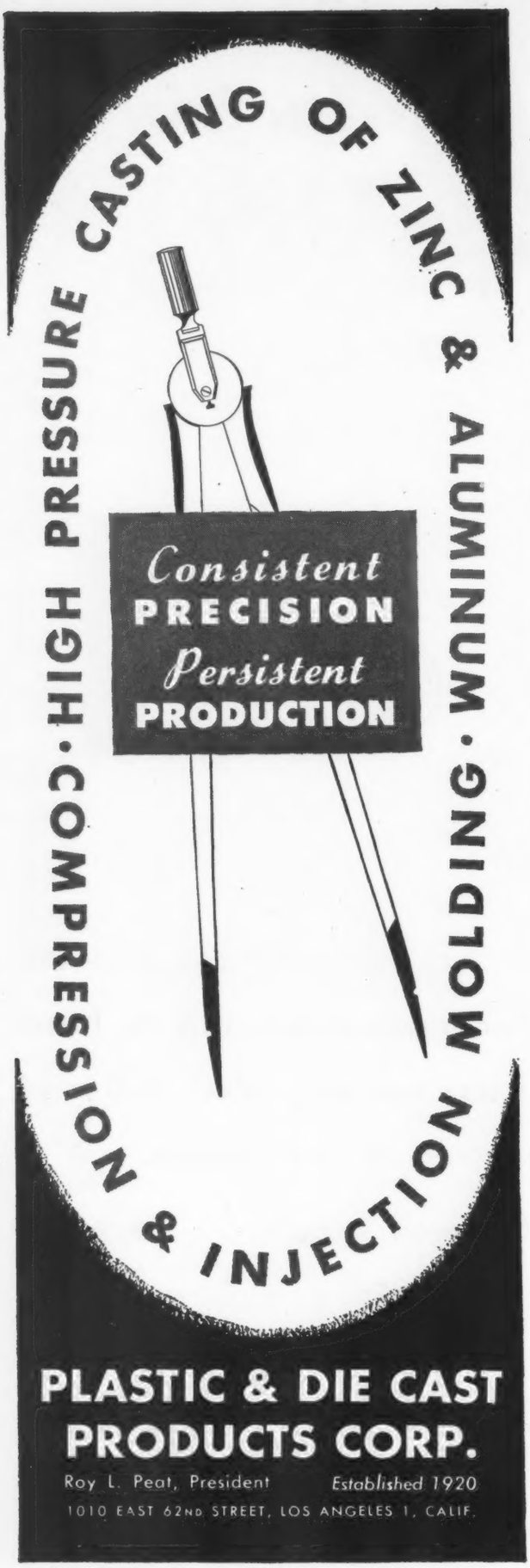
. . . a wonderful combination. Packages subjected to hard usage are very often dull and prosaic in appearance.

The well known b and p touch lifts this group into the "glamour" class, while improving its capacity for usefulness.

BROOKS & PORTER, INC.

304 HUDSON STREET . . . . NEW YORK, N. Y.

PACKAGING AND DISPLAY SPECIALISTS FOR HALF A CENTURY



Industrial packaging . . .

(*Continued from page 138*) displayed were in special types of packages developed for air delivery.

Educational exhibit

A wealth of informative material on protective industrial packaging was on hand in the educational exhibit staged as a feature of the IPEAA meeting. This display, under the direction of Dean B. Becker, consulting engineer, included an International Harvester manufacturing research project with small models of different types of pallets used in handling automotive service parts and another large exhibit by International showing a scale model set-up for the processing, packaging and handling of automotive service parts.

The latter layout, illustrating the handling of pistons and cylinder sleeves from the receipt of the rough parts to the packaging of the finished assemblies for shipment, incorporated roller conveyors, a monorail with overhead electric hoist, solvent washing and rinsing facilities, finger print removal, corrosion prevention, infra-red ray drying, and packing of the finished cylinder assemblies in cartons bearing the company's distinctive new trademark.

Other I-H models exhibited demonstrated the old and the improved method of loading tractors on flat cars, a saving of $1.50 per tractor being realized through the elimination of "A" blocking on the wheels; and typical applications of the standard "all-purpose" pallet.

Also shown in the educational exhibit was the family of standardized boxes used for precision cutting tools by Barber-Colman Co., Rockford, Ill.,[3] and an exhibit of printed merchandise preparation standards developed by Montgomery Ward & Co., as well as a series of photographs and models showing the elimination of dead weight in a shipping crate without sacrifice of product protection. Another section of the display consisted of drawings and engineering data by Mr. Becker devoted to the integration of materials handling with plant planning, layout and design.

Long-term storage packaging

Focal point of interest in the educational exhibit consisted of special packages developed by the Ordnance Research Department of International Harvester Co. for the preservation and storage of war materials over long periods of time, which were publicly shown for the first time at the IPEAA meeting. These packages mark the results of a program initiated about a year ago, when company engineers were asked to work in cooperation with Army Ordnance in developing methods of storing 30 billion dollars worth of arms and other equipment in strategic locations to which military personnel could be flown overnight in case of attack.

In the method worked out for preservation of the

[3] See "Precision Tools," MODERN PACKAGING, June, '45, pp. 132–133.

Are Any of these

YOUR *Packaging Headaches?*

Decotone Know-how will Tame them!

IF your package must protect your product from any of these hazards, Decotone research can formulate a packaging material which will do the job. Decotone developed and produced for war uses moisture, vapor-proof barriers; textile-lined, foil-combined-to-paper materials; special coatings; foil and/or paper laminated to grease-proof or films. Decotone know-how and facilities are ready to produce these and others for your peacetime packaging, attractively printed, if you wish.

Let us formulate a packaging material to meet the specific needs of your product. Write today!

DUST
MOISTURE
AIR
GREASE
CORROSION
SUNLIGHT
VAPOR
OILS
RUST
ODORS
DIRT

DECOTONE PRODUCTS DIVISION

CUSTOM-CREATES PACKAGING MATERIALS FOR SPECIFIC PRODUCT NEEDS

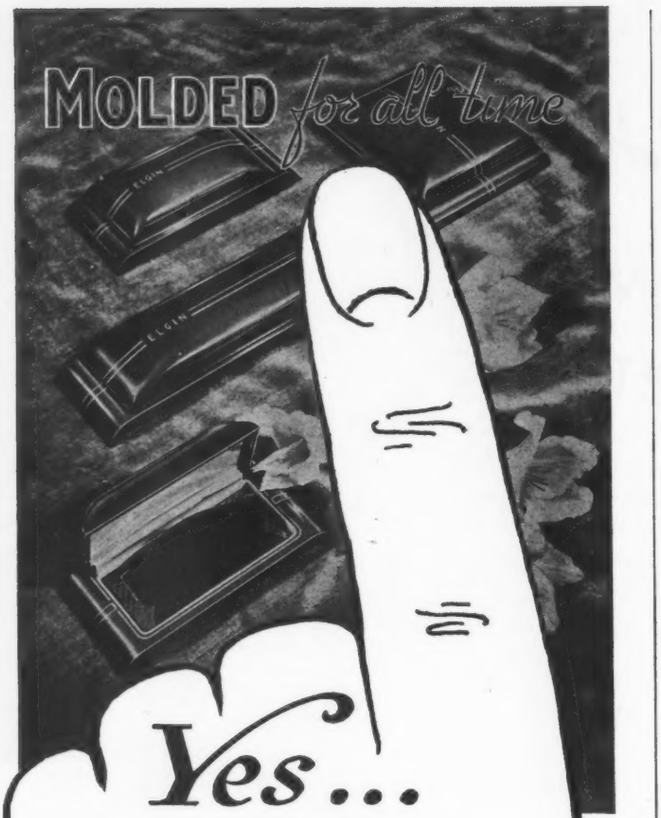
DECOTONE PRODUCTS

DIVISION

Fitchburg Paper Company

PACKAGING PAPERS *Converted Papers* SPECIALTY PAPERS

FITCHBURG, MASS.



Yes...

IT MAY BE POINTED OUT

that leading Watchmakers of America have thought well of Rathbun hinged plastic packaging for many years.

This exacting trade is continuing to look with favor on the efficiency and economy of Rathbun spring-hinging and the post-war package styling being built around it.

RATHBUN MOLDING CORP. PAT. 1833302 SPRING-HINGE

With the war's tremendous advancement of materials, unlimited possibilities are yours in molded plastics. We invite consideration of Rathbun hinged molded products for your packaging problems.

Rathbun MOLDING CORPORATION
SALAMANCA, NEW YORK

smaller equipment, standard, open-head, 55-gal. steel drums of 22½-in. diameter are employed, being extended or reduced in length as required. Interior supports are fashioned from such standard market materials as poultry netting, metal lath and steel wool. Standard locking-ring sections are used as supporting members in the drums and no special tooling is required. Corrosion of the packed equipment is prevented by the use of desiccants, such as silica gel, in the hermetically sealed containers. Among the products shown packed in this manner were automatic rifles, Garand rifles, 30-cal. machine guns, mortars and mounts, submachine guns, carbines, helmets and automatic pistols.

In a completed package, three of the drums are clamped between channel irons to form a pallet. These assemblies, containing no pockets to catch moisture, are given protection consisting of a primer, an asphaltic coating and sprayed-on 8-to-10-mesh gravel, according to the type of storage contemplated. The coatings used withstand humidity and temperature ranging from minus 60 degs. F. to 170 degs. F. In addition, the pallets lend themselves well to mechanical handling. In tests, they were transported in motor trucks over a Belgian-block course at high speeds, without injury to the packages or their contents.

Also on exhibit as part of the I-H ordnance project were model gasoline storage tanks housing miniature military automotive and artillery equipment. The use of large gasoline storage tanks, of which the government has a surplus of several thousand, is being studied for storage of heavy equipment, with test installations now under observation at Lima Ordnance Depot, Aberdeen Proving Ground and the Red River Arsenal, Texarkana, Tex. Each tank is equipped with recording devices which will make a continuous record of temperature and relative humidity over an experimental period of approximately one year. From these records, the relative merits of different systems under test will be determined.

Method of packing vehicles

In this system of long-term storage, the vehicles are prepared and the bottom of the tank is assembled on the foundation. Next the artillery or vehicles are towed or lowered into position and blocked up. Wheels or tracks are removed to relieve tension in bushings and bearings. Then the tank is completed by electrical seam welding, insuring leak-proof joints. Optimum relative humidity for the storage chambers appears to be about 30%, which is the same as that prevailing at Khartoum, Egypt. In view of the high state of preservation of many relics of ancient Egyptian civilization, this point is of some historical interest.

Commercial exhibits held in connection with the IPEAA exposition featured a wide range of industrial packaging and materials handling equipment and supplies. Considerable emphasis was placed on such products as improved types of laminated barriers for case liners and other protective applications; pallets of

Another Reason for CEL-O-SEAL

REG. U. S. PAT. OFF.

To preserve the freshness . . . you've got to preserve the vacuum. So Woods Bros. Coffee Co. seals the closure with a "Cel-O-Seal" band. It guards against loosening in transit . . . discourages tampering by inquisitive shoppers.

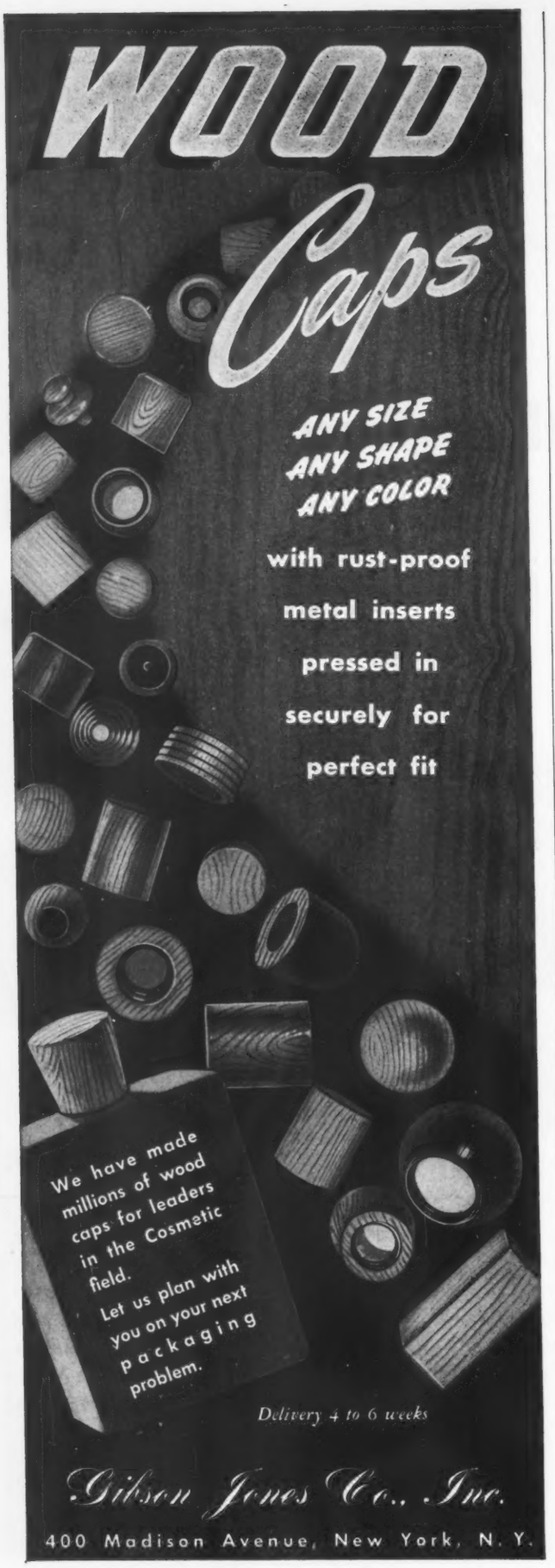
Effective? Originally adopted for use with a wartime closure, "Cel-O-Seal" bands are now standard protection for H&C Coffee.

"Cel-O-Seal" cellulose bands are manufactured by E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del. Also sold by Armstrong Cork Co., Lancaster, Pa., and I. F. Schnier Co., San Francisco, Cal.

DU PONT "CEL-O-SEAL" BANDS

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
THROUGH CHEMISTRY



various materials, including "expendable" units to be discarded after a single trip; strippable plastic coatings for small metal parts; improved types of glues, cushioning materials and strapping equipment; and the application of desiccants to peacetime packaging of many types of products subject to damage by corrosion and rust.

Frozen food foundation

Significant data on trends in the packaging and marketing of frozen foods were disclosed at the first meeting of the Frozen Food Foundation, Inc., in Syracuse, N. Y. The last day of the three-day meeting was an open house and inspection for suppliers of equipment and packaging materials and other interested nonmembers.

A group of the nation's largest department stores set up in Syracuse in 1943 a small company called Frozen Food Products, the prime purpose of which was to determine the most effective manner in which retail stores could enter the frozen food field and to operate as a pilot plant for any of the merchandising plans that might be devised.

It soon became apparent that a great deal more scientific and engineering information had to be accumulated.

The result was the formation a year or more ago, of the Frozen Food Foundation, with G. A. Fitzgerald, formerly of the technical staff of the Frozen Foods Division of General Foods, in charge. Mr. Fitzgerald has been staffing his organization with technicians from various universities and industrial organizations to carry out the program of research in nutrition, home economics, packaging and bacteriology being sponsored by the Foundation.

In addition to formulation of frozen food quality standards, development of new products and improvement of freezing processes, the Foundation is charged with the study of packaging materials and design, and, through cooperative work with packaging industries, the development of improved frozen food containers.

300 Syracuse families served

An essential part of the Syracuse operation is a test of what is known as the Frostmaster Plan. Three hundred Syracuse families receive their frozen foods from Dey Bros. & Co., Syracuse department store, by refrigerated truck, either on a pre-determined regular schedule or in response to telephoned orders. Each consumer cooperating with the plan has a 3-cubic-foot Frostmaster storage unit, designed by the Foundation and built to fit in and harmonize with conventional kitchen equipment.

Indications are that this is the type of distribution planned by the department store members, which in-

We're not new in Functional Papers

1883

...when bustles were bustles

The **Thilmany** *Paper Company was Founded*

We've come a long way in the manufacture of functional packaging papers since our inception sixty-three years ago.

Today, our modern organization includes large mills spread over 75 acres, vast natural resources, a technically trained staff of paper experts, the most modern paper making and converting equipment,and the very latest in modern laboratories where never ending research and exhaustive tests combine for a better paper product. No "has been" methods are used.

Thilco papers are beyond the ordinary. They are designed and made for the express functions of safeguarding a product for or against — grease, fats, oils, moisture, vapor, heat, cold, light, humidity, mold, vermin, odor, time, flavor and freshness. In addition, they can protect brand name and trade mark identity.

Thilco functional papers include MG Krafts and Tissues, Glassines and Greaseproofs, waxed and Thermo-Plastics, Waterproof papers, and Specialty Bags. Most are adaptable to printing or embossing for advertising value.

THILCO *Functional* PAPERS

THILMANY
PULP & PAPER COMPANY
KAUKAUNA · WISCONSIN

YES, shipping tags and labels can raise some tough questions. So, instead of losing sleep over them, why not do the obvious—consult Dennison *first*.

If you ship metals, Dennison knows the quality of tag stock that meets express requirements. Do you use bales? Dennison has a tag fastener that is ideal for them. Are your labels applied to rough wood? With our extra heavy adhesive, they really stick.

Dennison has specialized in the planning of shipping tags and labels for so many years that paying infinite attention to a host of details has become second nature. We can also show you how to make tags and labels do important *extra* jobs. For instance, deliver an advertising message . . . carry order or invoice reference . . . give warnings or instructions.

You can be sure your tags and labels will be correct in design and correct from a practical standpoint when you put your problem up to

Dennison

PAPER PRODUCTS THAT PRODUCE RESULTS

Dennison-developed tags and labels direct the shipments of many of the leaders of American industry. If those you now use fall short of your requirements, why not write Dennison Manufacturing Co., 5227 Ford Ave., Framingham, Mass.

TAGS • LABELS • SEALS • SET-UP BOXES • MARKING SYSTEMS • PAPER SPECIALTIES

clude such firms as R. H. Macy & Co. of New York and affiliates, the Marshall Field group, the May Co. of Cleveland and affiliates, T. Eaton & Co., Ltd., of Toronto, the J. L. Hudson Co. of Detroit, the Hecht Co. of Washington, F. & R. Lazaraus & Co. of Columbus, and all of the Allied Stores Corp. affiliates. Non-store members of the Foundation are the Aviation Corp. and the Carrier Corp., interested in the development of refrigeration equipment.

Speakers at the meeting declared that frozen foods represent "a ticket back to a field in which the department stores were once important factors."

"A great many department stores," said William Burston, executive of Allied Stores Corp., "in past years dropped their staple grocery business because they couldn't give an economic service at a profit. The frozen food field offers an opportunity to give a food service at a profit and in a way peculiarly the department stores' and within the normal framework of department store operation.

"The frozen food business is a packaged business and the department store business is a package business. The frozen food business requires special housing, to be sure, but special housing imposes no problem foreign to the department store. The frozen food business makes use of present available services—charge account, delivery, breadth of assortment, selling aids."

Forecast sales—$200 yearly per family

The Syracuse home-delivery test indicates that average annual per customer sales can run in excess of $200, in comparison with a yearly family average of only $5 or $6 for the nation as a whole. The department stores figure that over-the-counter business can produce sales of $200 per square foot of store selling space, in contrast to the current high average department store experience of about $70 to $80 per square foot.

Food, visitors were told, is America's biggest single business. Some $24 billion are spent on it at retail annually. Of this, about $250 million has been going for frozen foods. With proper promotion, adequate equipment and sound distribution methods, Foundation members feel, this $250 million has a potential growth to $10 or $11 billion.

Visitors toured the packaging and processing research laboratories and viewed various types of frozen food cabinets designed for displaying the products in department stores. A significant number of the packages in these cabinets contained unusual products, such as frozen pies, pastries, fish pastes and similar foods not normally thought of or encountered in connection with frozen foods.

Some of the results of packaging research being done by the foundation will be made available later for publication.

Correction—In March Modern Packaging, page 187, address of Addison Lithographing Co. should have been Rochester, N. Y.

"When you're asked about bottle finishes, remember this machine"

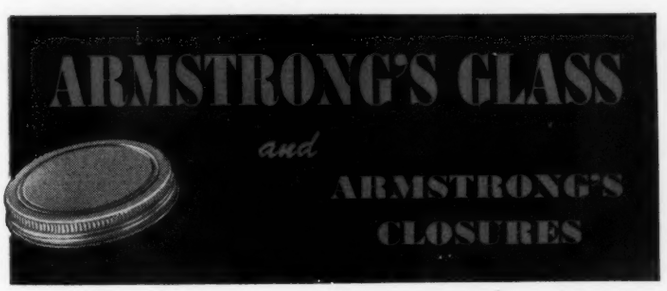
That's Clarence A. Maul talking, foreman in the Mold Shop at Armstrong's Millville, N. J., glass plant.

Listening to him are a group of Armstrong's Salesmen. They're studying by observing glass and closure production in Armstrong's plants as part of their extensive sales training program.

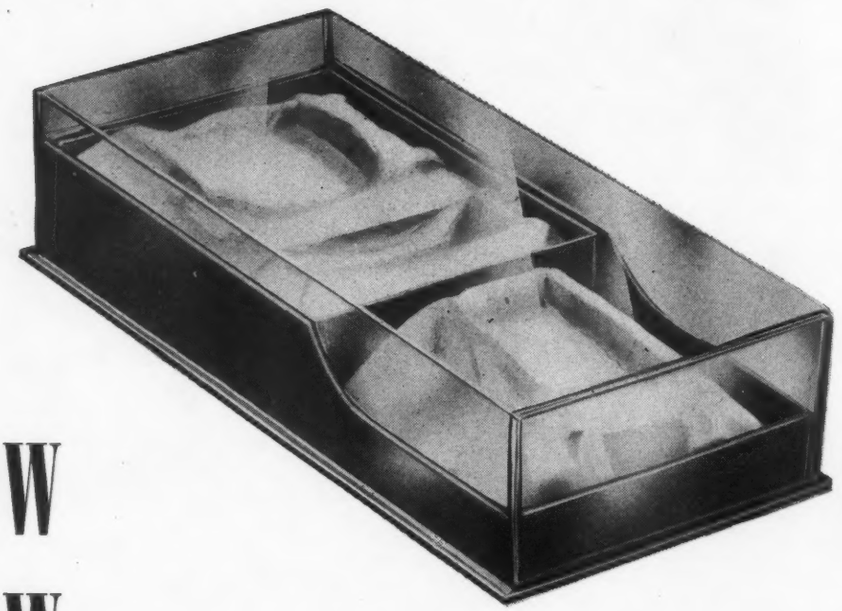
The machine Clarence is pointing to is a modern neck ring lathe. It produces dies for forming the finishes on Armstrong's glass containers. Along with many other modern machines in Armstrong's up-to-date plants, it plays a vital part in maintaining the top quality of Armstrong's ware.

Even more important is the role of the men who man the machines—men like Clarence Maul and Sam Cossaboon, the master machinist beside him. Together they represent 49½ years' experience in the highly skilled craft of mold-making. Their years of experience, skill, and pride of workmanship typify all the men your Armstrong representatives meet during their training program in our plants.

From craftsmen like these, your Armstrong's glass representatives gain practical knowledge that helps them do a better, more intelligent job of servicing your glass and closure needs. For complete information about Armstrong's Glass and Closures, get in touch with your Armstrong representative, or write Armstrong Cork Company, Glass and Closure Division, 5905 Prince Street, Lancaster, Pa.



SHOW WINDOW PACKAGING



Transparent covers combined with fine set-up board and paper platforms display your products to best advantage.

Better packaging will insure maximum sales. Outstanding products deserve eye-catching display. Try our boxes.

•

FERDINAND BUEDINGEN COMPANY

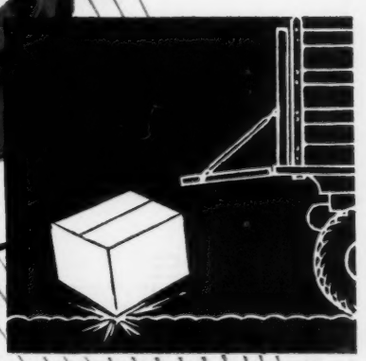
INCORPORATED

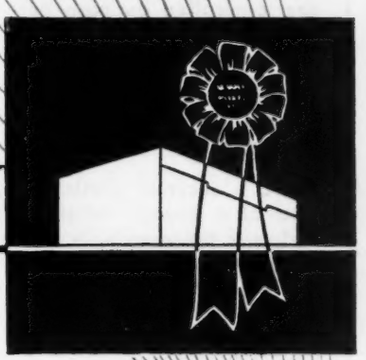
P. O. BOX 723 ROCHESTER 3, N. Y.

Gaylord Boxes

Engineered for PROTECTION

Designed for DISTINCTION





CORRUGATED AND SOLID FIBRE BOXES — FOLDING CARTONS
KRAFT GROCERY BAGS AND SACKS — KRAFT PAPER AND SPECIALTIES

GAYLORD CONTAINER CORPORATION GENERAL OFFICES ST. LOUIS

New York • Chicago • San Francisco • Atlanta
New Orleans • Jersey City • Seattle • Houston
Indianapolis • Los Angeles • Oakland • Dallas
Minneapolis • Jacksonville • Columbus • Fort
Worth • Tampa • Detroit • Cincinnati • Des
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10 YEARS IN THE MAKING

Speedry

ROTOGRAVURE *at its best*

SPEEDRY—
Improved design sealed ink fountain features side removal of cylinder and inking mechanism, eliminating press wash-up.

360 DEGREE RUNNING REGISTER CONTROL—
Hair line register, motor and gear controlled by push button or electric eye.

CONTROLLED IMPRESSION PRESSURE—
Micro - accurate pressure to parts of a pound. Motor or hydraulic powered with visual gauge.

LO-TEMP. DRIERS—
New Champlain individual driers using a high velocity balanced air system that dries inks at amazingly low temperatures.

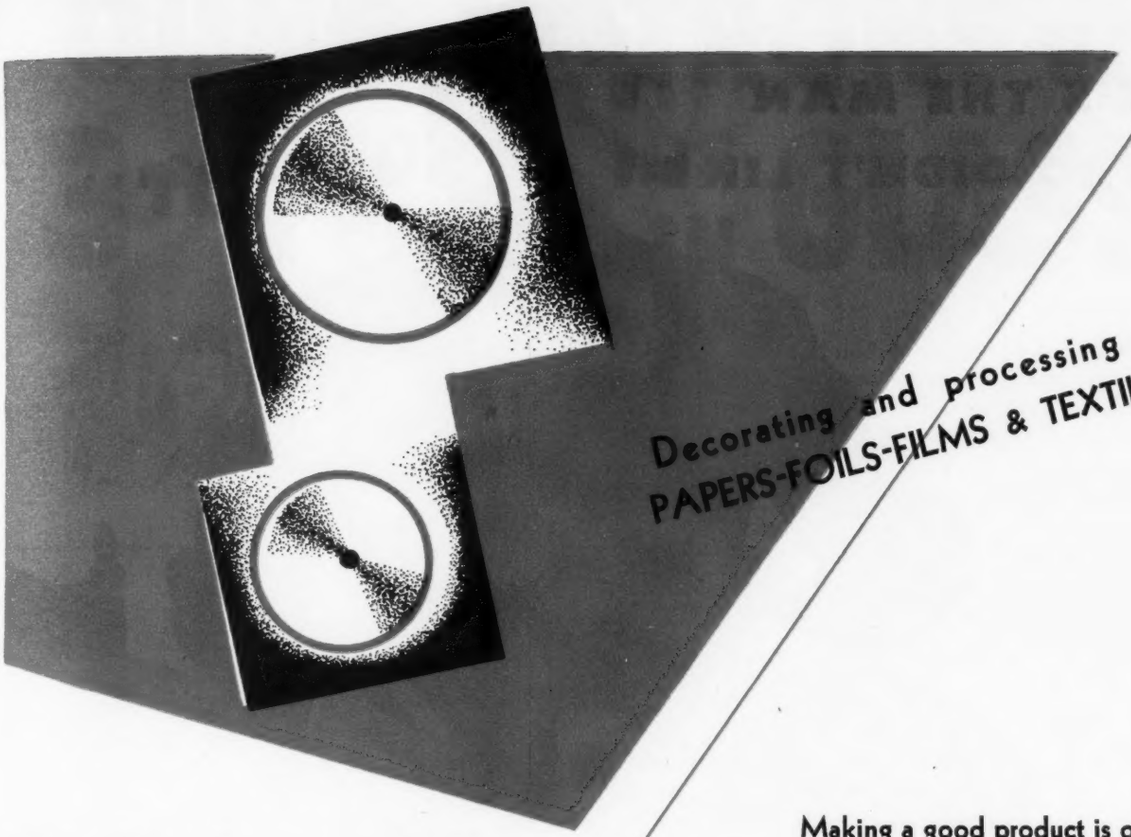
WEB CONTROL—
Unique breaker roll design that permits raising and lowering impression cylinder without affecting tension or register.

TEN YEARS IN THE MAKING
The majority of important practical improvements in commercial rotogravure have been originated and developed by Champlain, its users and associates.

CHAMPLAIN has the "KNOW HOW"
Champlain, with its wealth of experience and engineering knowledge, substantiated by so many successful installations can best offer the conversion and printing trades a simple, efficient and profitable Rotogravure Printer.

CHAMPLAIN
STANDARD ROTOGRAVURE

CHAMPLAIN COMPANY, INC. • 88 LLEWELLYN AVENUE, BLOOMFIELD, N. J.
Telephone • BLOOMFIELD 2-2350



Decorating and processing of
PAPERS-FOILS-FILMS & TEXTILES

The Package of the Future Must Sell the Product. . .

Making a good product is one thing—selling it in profitable volume, another. To attain a profitable sales volume of any product, farsighted sales managers have learned to place greater reliance on eye appealing and utility packaging. To design such materials is a job for experienced specialists. They must have at their disposal highly delicate processes of printing, coating, embossing and laminating to convert special papers, foils, films and textiles.

These facilities are fully available at Converter Corporation. If you have a problem in packaging for appeal of utility purposes, submit it to experts in our extensive development department.

Converter
CORPORATION

CLINTON, MASSACHUSETTS

C·C

HERE'S THE MAN WHO DIDN'T LIKE SALADS...

RABBIT FOOD he called them and, vitamins or no vitamins, he wasn't going to eat them . . . but Helen Harrison's French Dressing with Chutney made him change his mind. Now, he is a salad enthusiast . . . here is a dressing that really perks up salad flavor and gives it zest and tang . . . and it's fine with meats, game and fish. ◆ This popular French Dressing, packed by the Helen Harrison Company of Bloomington, Illinois, is dependably sealed with Crown Screw Caps. An exclusive feature—the Deep Hook Thread—gives this cap double sealing pressure with the same amount of application force. Crown Cork & Seal Company, Baltimore 3, Md. *World's largest makers of metal closures.*

CROWN CLOSURES

YOUNG MATRONS VOTE 3 TO 1 FOR FOODS PACKED IN GLASS!

Modern young housewives display the strongest preference for the modern package—a glass container.

Millions of smart, young women are becoming homemakers each year. Their overwhelming vote in favor of foods and household products packed in glass was established in a recent survey by a noted public opinion analyst.* It is sending glass popularity up . . . up!

Here's why these alert young matrons say they choose glass-packed products:

ATTRACTIVENESS:

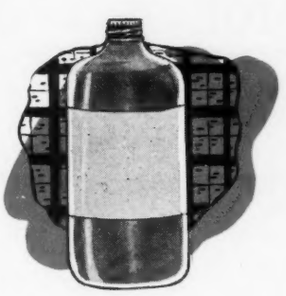
Glass-bright displays are eye-inspiring, invite their purchase. These modern containers add color and a spick-and-span sparkle to their pantry shelves.

VISIBILITY:

They see what they want —want what they see when it's packed in glass containers. Glass shows size, style, color and the amount. Goodness sells itself.

PROTECTION:

Food in glass keeps fresh, flavorful . . . tastes good. 64.7% of young mothers interviewed prefer glass-packed baby food—they trust the safety of glass.



CONVENIENCE:

A glass container is easy-to-handle . . . keeps clean . . . shows when to buy more. Leftover portions can be stored in the original container. No waste!

Duraglas containers have all the advantages of glass packages and more. Their lightweight strength assures easy handling . . . their trim proportions mean compact storing . . . their natural beauty makes sparkling displays. You sell more . . . need less selling time . . .with products packed in glass containers—Duraglas Containers!

**Name supplied upon request. Average is based on eight key classifications: pears, peaches, fruit salad and cocktail, baby food, coffee, salad or cooking oil, beets, food-beverages.*

ESPECIALLY IN Duraglas CONTAINERS

OWENS-ILLINOIS GLASS COMPANY • TOLEDO 1, OHIO • *Branches in Principal Cities*

"Masterly, Outstanding"

says

FRANK VINING SMITH

That renowned painter of stirring marine subjects wrote us:

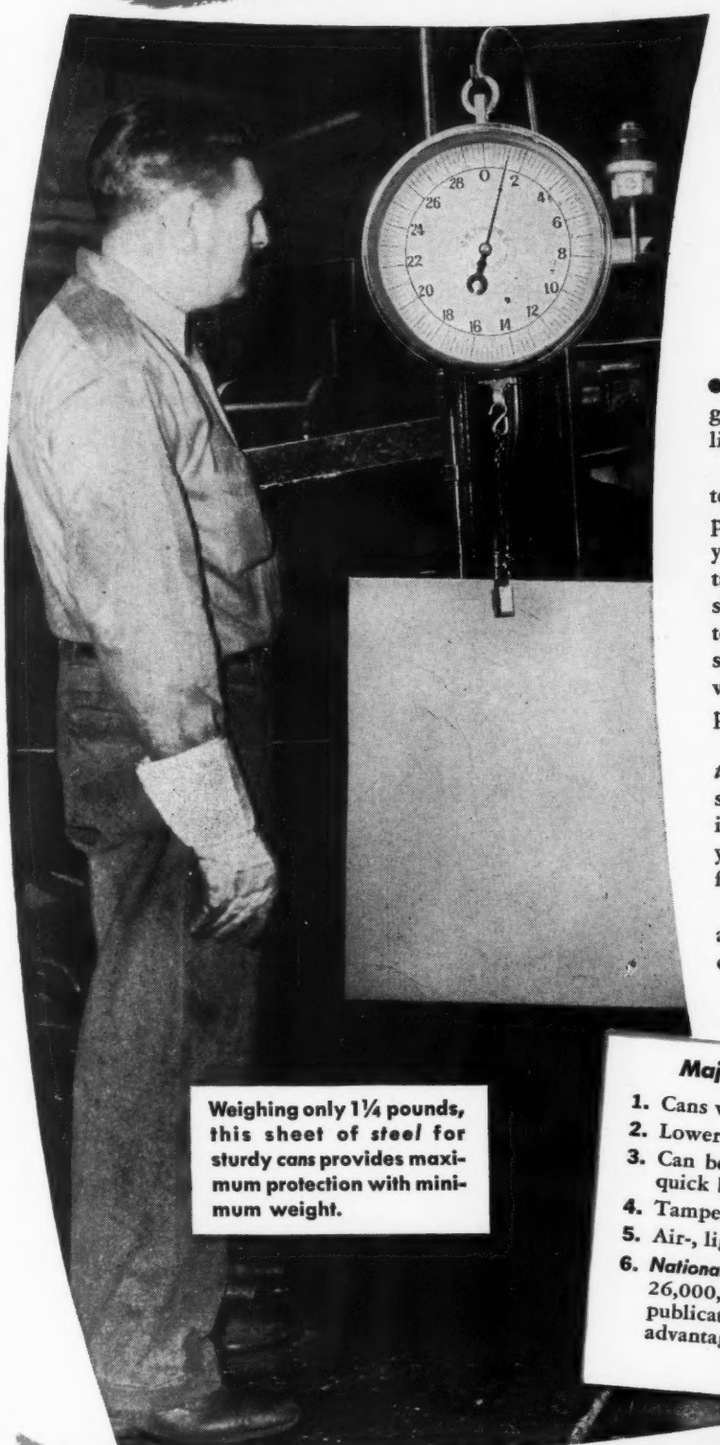
"This letter will express my sincere appreciation of the masterly way in which you have translated the color and feeling of my painting 'Red Jacket' which appears on the 1946 Plymouth Cordage calendar. It is far superior to many of the current reproductions of my work, and has a delicacy and variety of tones which make it outstanding."

CALENDARS BY FORBES ARE SUCCESSFUL CALENDARS

(No stock designs.)

FORBES LITHOGRAPH CO.
NEW YORK CLEVELAND
P.O. Box 513 Boston 2
CHICAGO ROCHESTER

STEEL... LIGHTWEIGHT TO SAVE FREIGHT!



Weighing only 1¼ pounds, this sheet of *steel* for sturdy *cans* provides maximum protection with minimum weight.

● Protection without poundage! That's what you get when you pack your *products* in durable, but lightweight, *steel cans.*

Pressure-rolled to fractional thinness and heat-tempered for greater *strength,* the lightweight steel plate for sturdy cans keeps freight costs low for your packaged products. *Shatterproof* steel containers also eliminate the need for compartmented shipping cartons to protect products on their way to retail markets. And *compact* cans require less space on trucks and trains . . . can be stored conveniently without danger of profit loss due to package damage.

Consumers, too, prefer products packed in *easy-to-handle* steel cans that can be conveniently and safely carried home in shopping bags... save space in closets, kitchens and on storeroom shelves. And your merchandise sealed in steel can be stocked for future use fully protected against loss of quality.

Yes, for lower production and shipping costs and all-round product protection, you can count on *economical* steel cans.

Can Manufacturers Institute, Inc., New York

Major Reasons for Packing Products in Cans

1. Cans won't break, split, crush or tear.
2. Lower filling, shipping and handling costs.
3. Can be colorfully lithographed for effective display and quick brand identification.
4. Tamperproof cans eliminate danger of substitution.
5. Air-, light- and moisture-proof cans preserve quality.
6. ***Nationally Advertised*** — This month alone more than 26,000,000 full-page, full-color ads in leading national publications are bringing home to shoppers the many advantages of buying merchandise packed in cans.

NO OTHER CONTAINER PROTECTS LIKE THE CAN

Buyer making "Peace Plans" for a better steel container

WHEN peace plans call for steel containers, keep the Continental Triple-C trademark in mind. The Triple-C means best in quality and service. Continental steel containers are rugged, economical . . . come in numerous sizes and types for scores of varying uses. Be sure to include Continental steel containers in *your* peace plans.

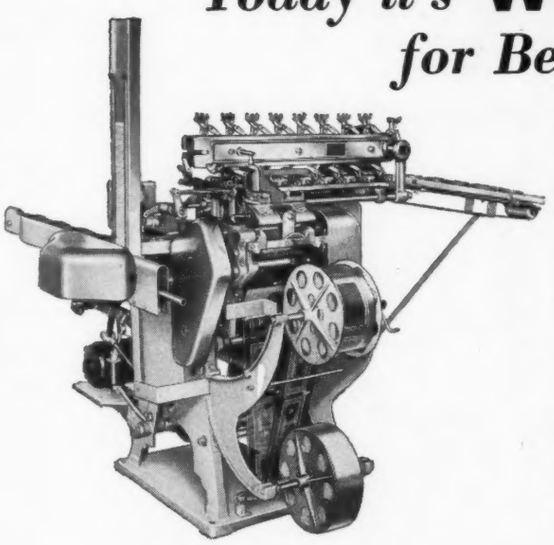
Tune in: "Continental Celebrity Club," every Saturday night over coast-to-coast CBS Network

A COMPLETE LINE OF STEEL SHIPPING CONTAINERS

The Triple-C means best in quality, service

CONTINENTAL CAN COMPANY

Today it's WRAP-O-MATIC *for Better Product Wrapping*



WRAP-O-MATIC
PACKAGING EQUIPMENT

For wrapping candy bars, biscuits, and cookies. Wrap-O-Matic is the most popular Wrapping machine in the Confectionery and Bakery field . . . a real tribute to the flawless wrapping by Wrap-O-Matic.

SMART merchandisers of confectionery and bakery products are quick to recognize the extra advantages of Wrap-O-Matic wrapping . . . especially when those products are fragile or of irregular shape. The delicate handling by Wrap-O-Matic eliminates the use of collars or other protective materials permitting your products to be displayed in full view when using transparent wrapper.

Wrap-O-Matics are economical . . . you save as much as 75% in wrapping labor and up to 35% in wrapping material. Production is at high speed . . . up to 120 units per minute. Wrapping is accurate . . . electric eye controls register of wrapper on product.

For better product wrapping you can't beat Wrap-O-Matic. Our engineers will be glad to survey your wrapping operations and show you how you can profit with Wrap-O-Matic. Write today for illustrated brochure and more details!

Lynch Package Machinery Corporation

TOLEDO 1, OHIO, U.S.A.

HIT PEACE TIME COMPETITION WITH

HEEKIN CANS

ANY SHAPE · ANY SIZE · ANY COLOR · ANY QUANTITY

THE HEEKIN CAN CO., CINCINNATI 2, OHIO

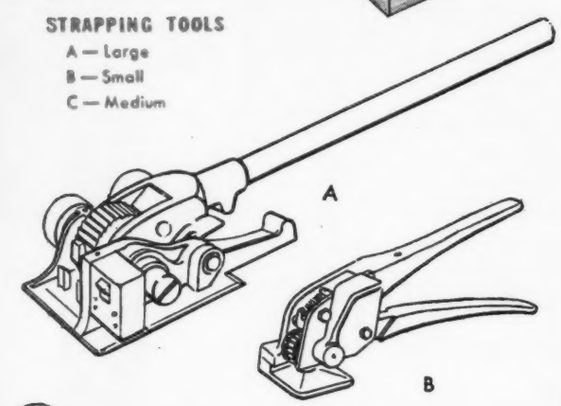
BETTER STRAPPING TOOLS

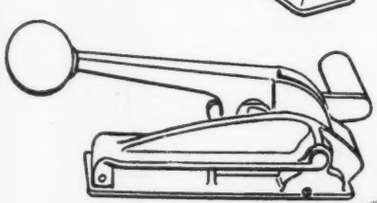
*Cut Shipping Costs—
*Reduce Damage Claims

Speed and economy in the shipping department is the first advantage of improved strapping with Steelband tools. Equally important is safe delivery of the goods in good condition —damage claims reduced to a minimum. All-round satisfaction is the total result.

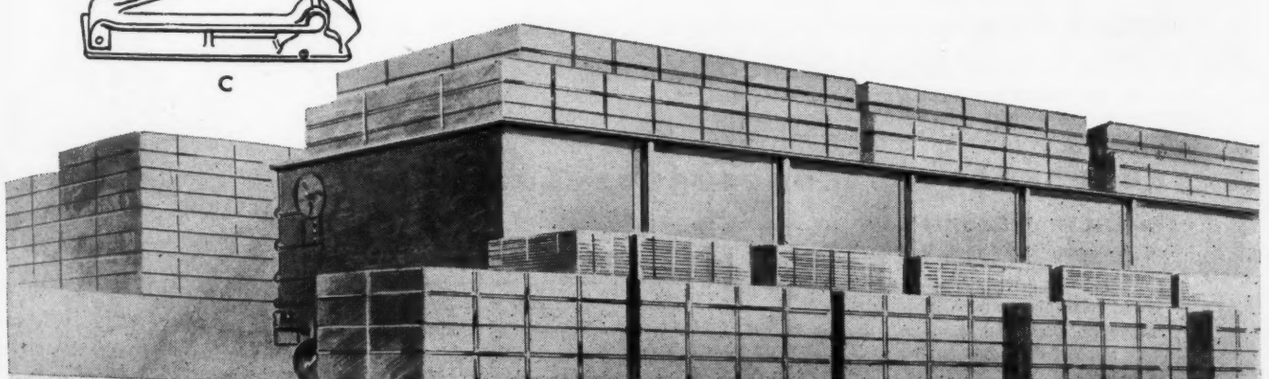
Largely occupied till now with Government demands the facilities of Steelband are becoming available for more normal requirements of industry. The needs of each user will be separately and specifically considered. Consultation is invited.

STRAPPING TOOLS
A — Large
B — Small
C — Medium



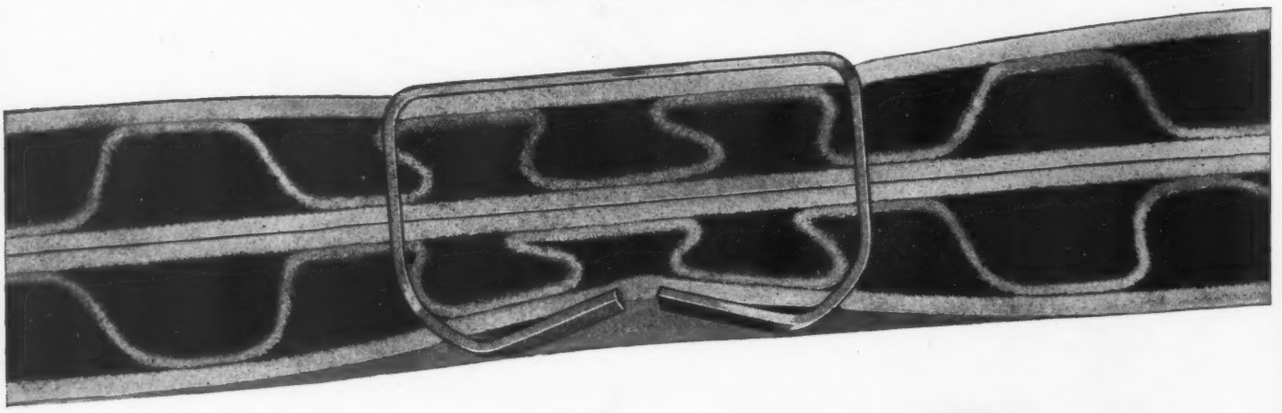


AMERICAN STEEL BAND COMPANY
PITTSBURGH, PA. ESTABLISHED 1891 PLANT, CARNEGIE, PA.
ROOFING • SIDING • VENTILATORS • DUCTS • STEEL STRAPPING • SPECIALTIES



Steelband Shipping Service

Save money by STITCHING the MORRISON Way



YOU can save money—and time—in closing your corrugated and solid fibre containers by using Morrison wire stitching machines. These rugged, speedy, heavy-duty stitchers give you neat appearing, strong, pilfer-proof cartons, even when operated by inexperienced help. The machines do all the work . . . cutting, forming, driving and clinching the wire in one instantaneous operation. A cost analysis for closing your cartons will be sent you, without obligation, if you will merely fill in and mail the coupon below.

MORRISON
STITCHING MACHINES

SEYBOLD DIVISION

HARRIS-SEYBOLD-POTTER COMPANY, DAYTON F7, OHIO

Note: We also manufacture a complete line of book, steel, metal and aircraft stitchers. Sales and Service Representatives in all principal cities in the United States and Canada.

HARRIS-SEYBOLD-POTTER COMPANY, Dept. M-56.
819 Washington Street, Dayton, F-7, Ohio.

We use Tape_____ Glue_____ Tape and Glue_____ Staples_____

Average carton size used_____ One_____ or three_____ strips per end

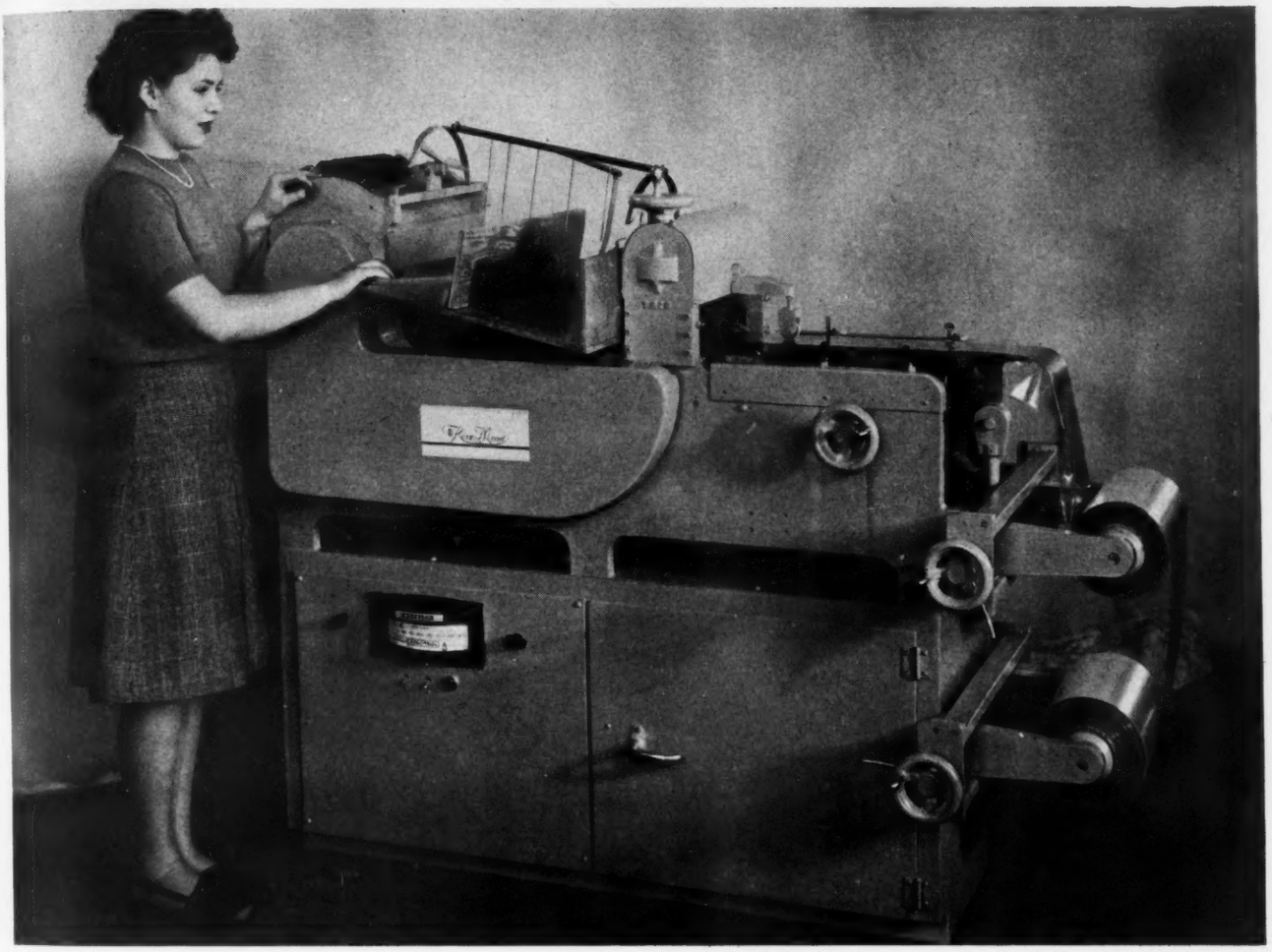
Number of staples per carton_____ Approximate number of cartons per year_____

Company .....

City and State .....

Attention Mr. .....

MAKE YOUR OWN HEAT-SEALED BAGS . . . *QUICKER!*



Cut your costs . . . ELECTRONICALLY . . . with this high-output, low-cost bag-maker

Now you can cut your bag expense and greatly increase your output with the new Kono-Mead Bag Builder, now coming off the assembly line daily.

This machine is electronically controlled, to produce heat-sealed bags at a cost-cutting rate of 4 thousand to 15 thousand bags per hour. And one girl can easily operate it!

Bags can be flat or square, from 1½ to 9 inches wide and from 2 to 18 inches in length. May be made of Konophane, Pliofilm, cellophane, diaphane or any of the heat-sealing coated papers. For additional strength and protection, heat-sealing can be combined with glue-sealing, thus producing a seam stronger than the material itself.

Write for full particulars.

Kono-Mead

KONO-MEAD EQUIPMENT CO. 133-23 35th Ave., Flushing, N. Y. Phone: FLushing 3-8113

Test demonstrating definite mold retarding action of Anti-Mycotic Diafane. Bell jars were installed in high-humidity room at 100 deg. F. and 90-95% R.H. Each jar contained three slices of bread. Watch glass containing one drop of anti-mycotic agent was placed under tripod in "A"; piece of bread wrapped with the agent in "B"; nothing in "C". Photographed after one week, bread in "A" and "B" jars were completely devoid of mold, "C" was covered with various molds.

ANTI-MYCOTIC *Diafane*

Heavy economic losses are caused by the hundreds of kinds of fungi and molds that affect baked goods, drugs, foods and textiles.

To combat this, the Riegel Laboratories have perfected a method of adding an anti-mold treatment to Riegel's Diafane. Early tests produced the remarkable results shown above, and a number of bakers are now using this new wrap with highly satisfactory results.

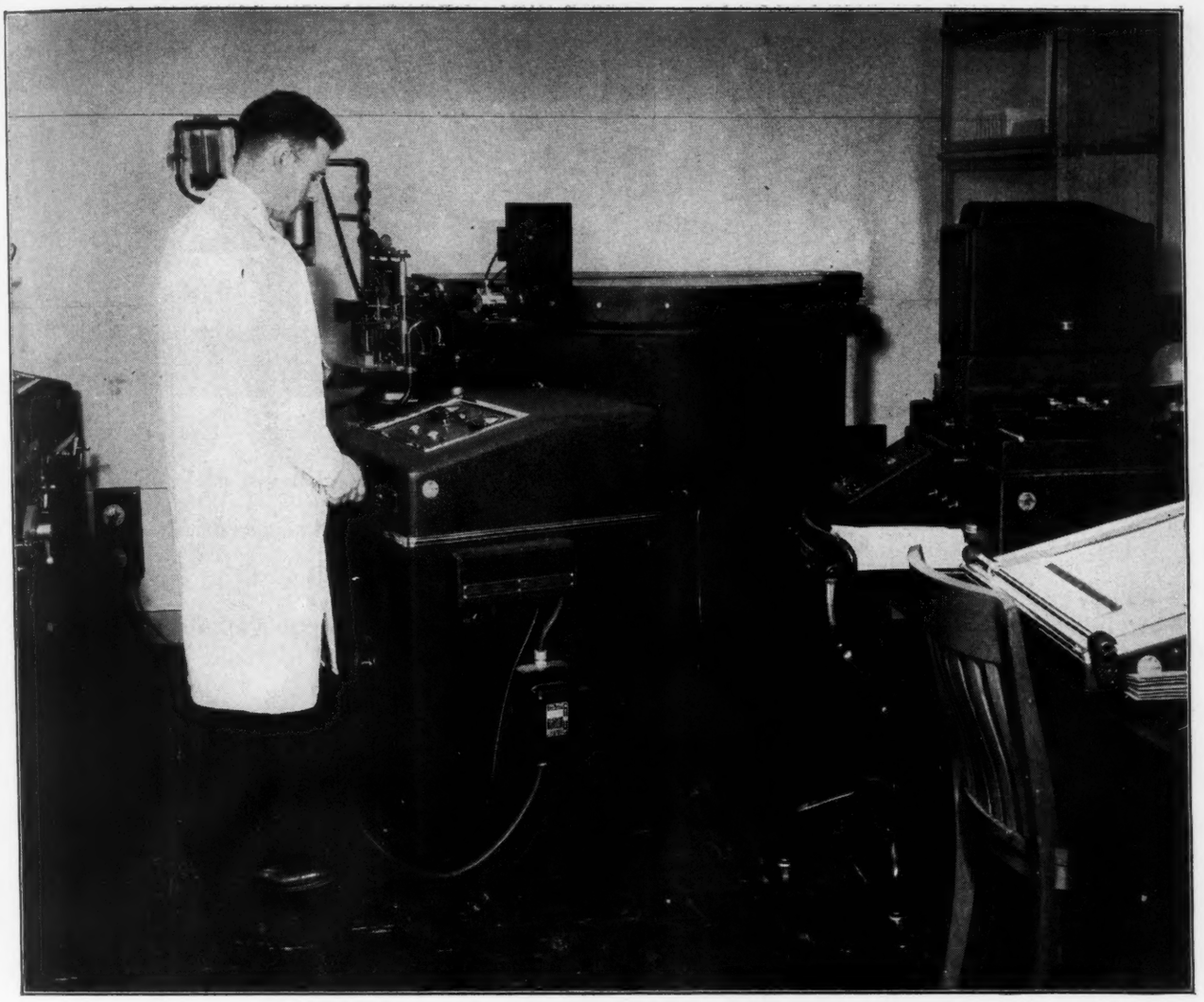
The effect of Riegel's Anti-Mycotic Diafane is due to gradual vaporization and does not depend upon actual contact for the results shown. It will increase the shelf life of many products and reduce returned goods. No flavors are imparted to the product, and even slightly stale odors are arrested before they begin to form so that original freshness is retained for a much longer time.

Limited orders are now being solicited for printed Bread-wrap Diafane with the anti-mycotic feature and it will soon be available in all Diafane.

Riegel's Anti-Mycotic Diafane will soon take its place as an outstanding achievement in the speciality paper field. Write now for samples, prices and complete technical information.

RIEGEL PAPER CORPORATION
342 MADISON AVENUE, NEW YORK 17, N. Y.

Riegel's Diafane



The machine that looks inside steel for you

Quite a machine, this spectrograph at American Can laboratories at Maywood, Illinois.

First, the steel is heated in a high-energy electrical discharge until it gives off light.

Then it resolves this light into its component parts.

Finally it takes a picture of these component parts on photographic film. This is called the spectrum of the sample. This spectrum is just as characteristic of the steel as an individual's fingerprints. It actually reveals the composition of the steel.

So then what?

Well, American Can scientists evaluate the spectrum and determine at once whether the sample meets established specifications.

Spectrographic analysis like this is an important part of American Can's quality control. Its purpose? To assure our customers that the steel in their containers will have the corrosion resistance it needs to do their specific container job.

Quality control in steel, thickness of tin plate, solder, sealing compounds, enamel, and all the countless steps in can manufacture are but a part of American Can's service to its customers.

There is marketing research, the design of lithographed labels, processing help —to mention only a few more services. Why not ask our representative for further details? Or write:

AMERICAN CAN COMPANY CANCO New York • Chicago • San Francisco

WORLD'S LARGEST MANUFACTURERS OF FIBRE AND METAL CONTAINERS

THE LABEL *must stick*

In their service to doctor, druggist and consumer, The Upjohn Company, "Fine Pharmaceuticals since 1886," regard the label of each package as part of the product it contains. This means that the label must stick—every time and all the time.

With Arabol Adhesives, the important job of seeing that Upjohn labels stick becomes mere routine. The teamwork between Arabol and 60 New Jersey Pony Labelrite machines makes Upjohn labeling a smooth operation.

★ ★ ★

We are proud to serve The Upjohn Company with Arabol Adhesives—as we are proud to serve the leaders in many fields. Over the past sixty years, more than 10,000 adhesives formulas have been developed in the Arabol Laboratories. Each was designed to do one specific job. See your Arabol Representative when he calls; he knows adhesives.

PIONEERING
in the making of
ADHESIVES THAT WORK

THE ARABOL MANUFACTURING CO.

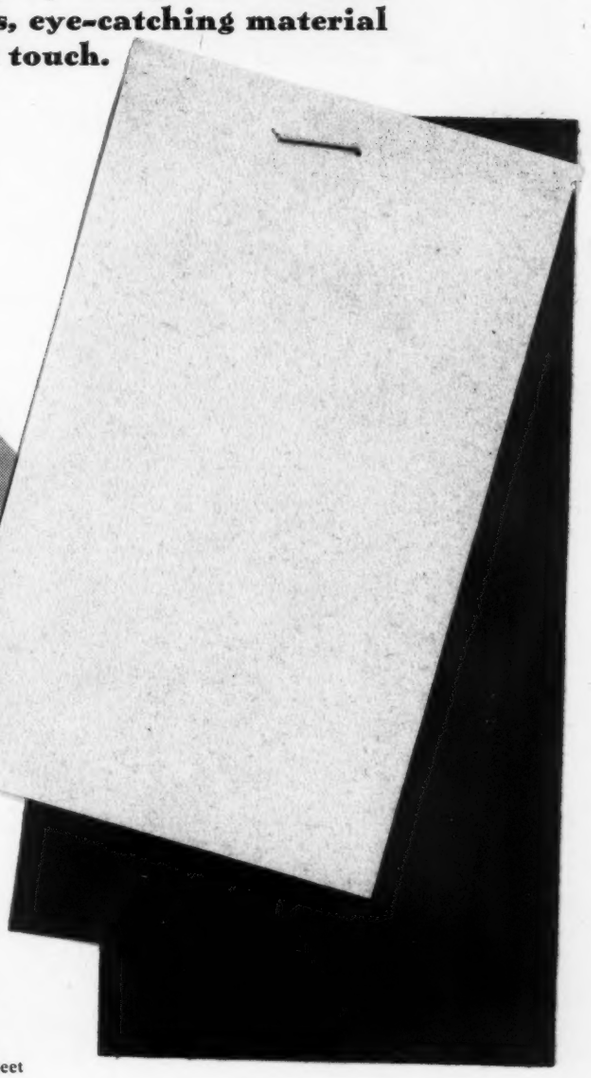
Executive Offices: **110 East 42nd St., New York 17, N. Y.** **CHICAGO—54th Avenue & 18th Street**
SAN FRANCISCO—30 Sterling Street • *Branches in Principal Cities* • *Factories in Brooklyn, Cicero, San Francisco*

Adhesives?... **ARABOL!**

Velours heen

The NEW persuasive packaging and display material with eye and touch appeal

If seeing is believing, touching is doubly so. Put double sales punch into your packaged product and display by using Velours heen, the NEW luxurious, eye-catching material with the velvet-soft touch.



THREE WEIGHTS

Box Weight
Draping Weight
Cover Weight

Write for Samples

BULKLEY, DUNTON & CO.
INCORPORATED
295 MADISON AVENUE, NEW YORK 17, N. Y.
CHICAGO 16, 2635 South Wabash Avenue • LOS ANGELES 13, 124 West 4th Street

M·V·T. may mean nothing to you

....but it means a lot to HER!

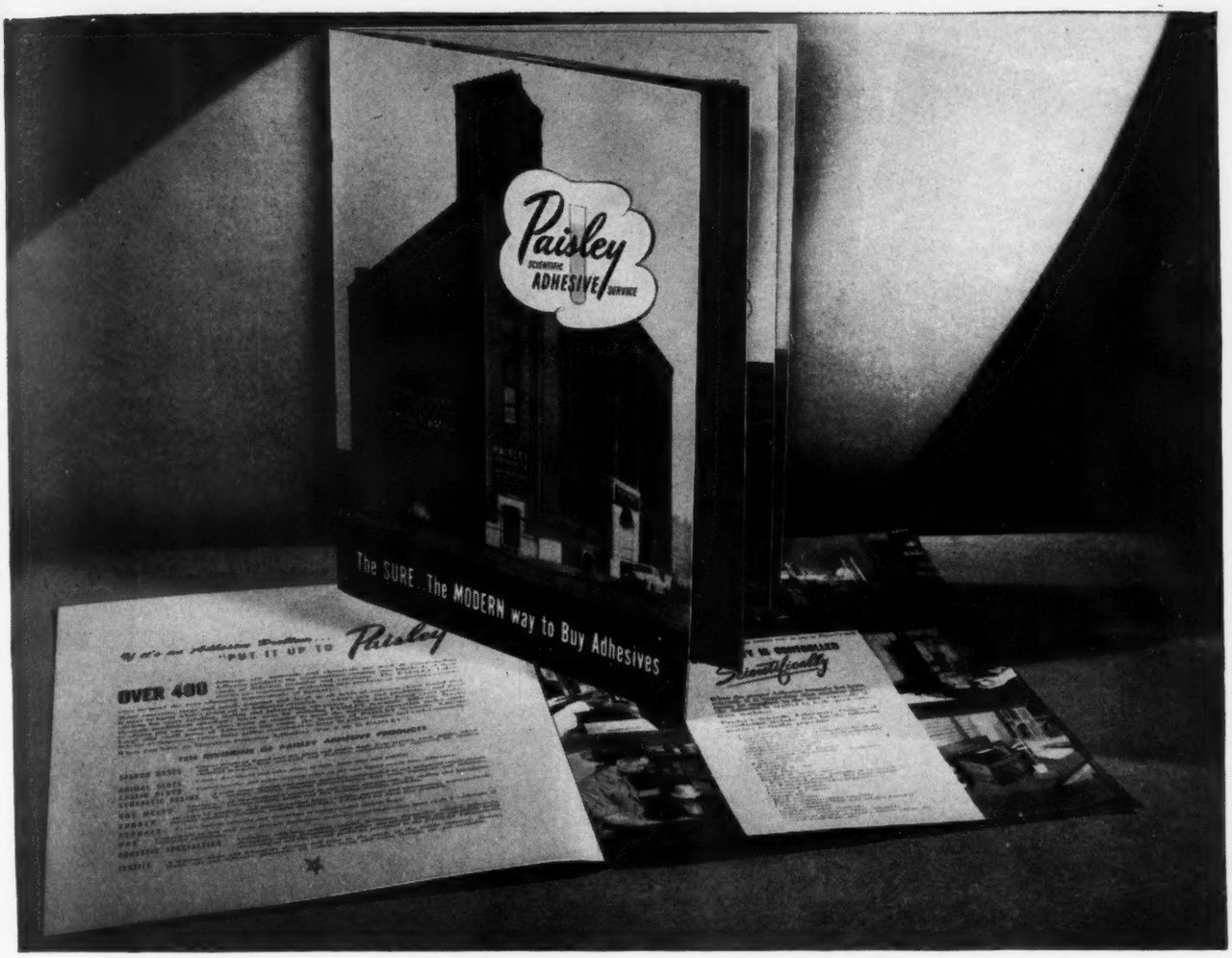
And, gentlemen, meet the power behind the throne, the lady behind your job, the consumer whose choice among brands eventually means your success or failure. She knows what moisture changes can do to a product, and she wants it as it was when first packed by you. She chooses the quality way, and if you have overlooked the importance of moisture-vapor control in your packaging, your product will be one she passes over.

You can't afford to fall down on your M. V. C. Darex Thermoplastic Coatings, made to provide moisture-vapor control, go all the way from packer to consumer without change in quality. They aren't magic, but they are good sense. How about a talk with us?

Dewey and Almy Chemical Company, Cambridge 40, Massachusetts.

Assured protection for moisture-sensitive products

DAREX *Thermoplastic* COATINGS



SEND FOR OUR NEW EIGHT-PAGE ADHESIVE FOLDER

Everyone uses adhesives! From the simple white Library Paste of your kindergarden days, to the highly developed formulas for modern industry, adhesives are used universally. Yet how few understand even the elementary principles of their production.

We've prepared this attractive new eight-page folder to help industrial users and buyers of adhesives to gain greater knowledge of this increasingly important subject. For buying *efficient* adhesives is no longer a simple matter. Depending upon the operation involved, it may require all the skill and resourcefulness of "Paisley Scientific Adhesive Service".

So, avail yourself of the opportunity to benefit by the valuable adhesive information this folder contains. Learn more about the Paisley way of creating, producing, and controlling a modern adhesive formula. Will you use the coupon provided here, in sending for your copy? Be sure to tell us the TYPE of business you conduct. This information will permit us to include other valuable data pertinent to your business.

ATTACH THIS COUPON TO YOUR LETTERHEAD AND MAIL!

Gentlemen:

Please send us a copy of your new, free, eight-page folder entitled "The SURE.. The MODERN way to Buy Adhesives". I am indicating below the kind of business we conduct. Include any other information on adhesives that specifically apply to our business.

FIRM_____

STREET_____

CITY_____ STATE_____

TYPE OF BUSINESS_____

PAISLEY PRODUCTS INCORPORATED

Manufacturers of Glues, Pastes, Resin Adhesives, Cements, and Related Chemical Products

1770 CANALPORT AVE., CHICAGO 16, ILL. ★ 630 W. 51st STREET, NEW YORK 19, N. Y.

Illustrated are three of the latest Blue River All-In-One Packages designed for counter use and as home or boudoir accessories. Each is fabricated in sparkling plexiglass. Revlon package features a hinge cover. A unique plexiglass snap lock holds the bottle firmly in place in the Maria Danica package.

Compare your packaging with these exclusive stand-outs

Manufacturers are quick to discover the sales appeal designed right into every Blue River Exclusive. Henry Rosenfeld, Revlon and Constance Bennett are just a few of the forward-looking companies using Blue River Exclusives to spotlight their products on the counter . . . and in the home.

DYNAMIC COUNTER DISPLAY — AND LOVELY HOME OR BOUDOIR ACCESSORY

The "talk of the trades" All-In-One Package, designed by F. J. Nussbaum, is a dynamic counter display . . . *also* a lovely, lasting home or boudoir accessory to be admired . . . and treasured for years. Precision-fabricated in gleaming Plexiglass, Blue River Exclusives . . . the luxury settings for fine products . . . are executed in clear crystal and a ravishing array of every color of the rainbow.

IMMEDIATE PRODUCTION FOR YOUR EXCLUSIVE PACKAGE

WRITE, PHONE or WIRE for a preliminary consultation with a Blue River Representative. He will be happy to study your product or line . . . entirely without obligation to you . . . and tell you how you can have your own individually designed Blue River Exclusive put into immediate fast-moving production to keep you out front in today's competitive market.

PACKAGES FOR EVERY LINE!

Blue River "Exclusives" are ideal for gloves, neckties, stockings, handkerchiefs, gift merchandise and a wide range of consumer products calling for the ultra-smart in packaging.

BLUE RIVER PLASTICS MANUFACTURING CORPORATION

F. J. NUSSBAUM, Pres. 473 HUDSON AVENUE BROOKLYN 1, NEW YORK NEvins 8-2197

FABRICATORS AND DESIGNERS OF PLASTIC ORIGINALS

What you don't know *can* hurt you!

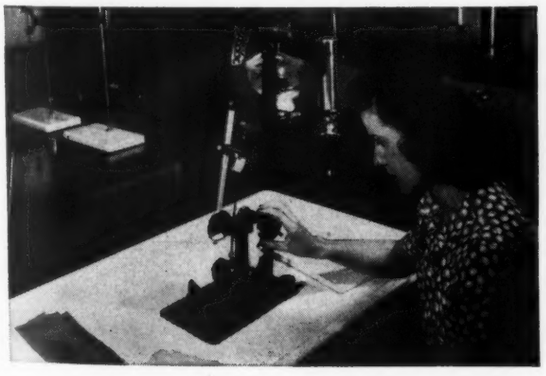
If you've never tried
American Anode latices and mixes
for coating and impregnating paper...
You may not know what you've missed

There has been so much recent progress in the field of coating and impregnating paper with latices and mixes, it's doubtful if, in these busy days, paper chemists and engineers have been able to keep up with it.

That's why we invite you, now, to tell us what you are doing and how you are doing it. There's a good chance that we may be able to help you make a decidedly better product at a lower cost.

You'll like the inherent safety features of water systems, too; no dangerous, explosive solvents; no cumbersome and expensive recovery systems.

Latices and mixes of natural and synthetic rubbers, GEON, HYCAR, neoprene, and Saran are available from our bulk storage. For more information about the *modern* way to coat and impregnate paper, please write Department AC-5, American Anode, Inc., 60 Cherry Street, Akron, Ohio.



The American Anode laboratory in Akron is equipped with the latest and most modern paper testing equipment, and is staffed with people who know how to use it.

AMERICAN ANODE
INCORPORATED

NATURAL AND SYNTHETIC RUBBER LATICES, WATER CEMENTS AND SUSPENSIONS

ANOTHER *Sefton* SUCCESS!

Rutherford's
FOOD CORPORATION
OF KANSAS CITY, MO.
FINDS
STRING OPENING CANS
TOPS
FOR ITS
CHILI POWDER!

Every day we hear of new successes of Sefton Fibre cans! Rutherford's Food Corporation of Kansas City, Mo. is a typical example. This noted company has found the string-opening can ideal for its Hy-Power Chili Powder. It's factory sealed . . . is easy to open . . . and can be closed again. Just one of the many, many type cans Sefton has to offer . . . for your product!

Sefton
FIBRE CAN
COMPANY
ST. LOUIS . . . . . NEW ORLEANS

DISTRICT OFFICES: • Los Angeles • San Francisco • Denver • Tampa • Chicago • Des Moines • New Orleans • Boston • Detroit • Kansas City • St. Paul Omaha • New York • Cincinnatti • Cleveland • Oklahoma City • Pittsburgh • Memphis • Nashville • Dallas • Houston • Salt Lake City • Seattle

Reveal PRODUCT Personality...

WITH AN **Arnrus**

PLASTIC CONTAINER

All Shapes
All Protected
All Textures

More and more manufacturers are realizing the advantages of letting their products speak for themselves . . . through a transparent plastic package.

Wonderfully and magically malleable in creative hands, plastic containers will enhance your product and provoke "on the spot" sales.

Consult designers of Arnrus products for your plastic packaging problems. They can compete successfully in price with other types of boxes and can excel all in bringing sales-appeal to your customer.

NATIONAL TRANSPARENT PLASTICS COMPANY
SPRINGFIELD 1 **MASSACHUSETTS**

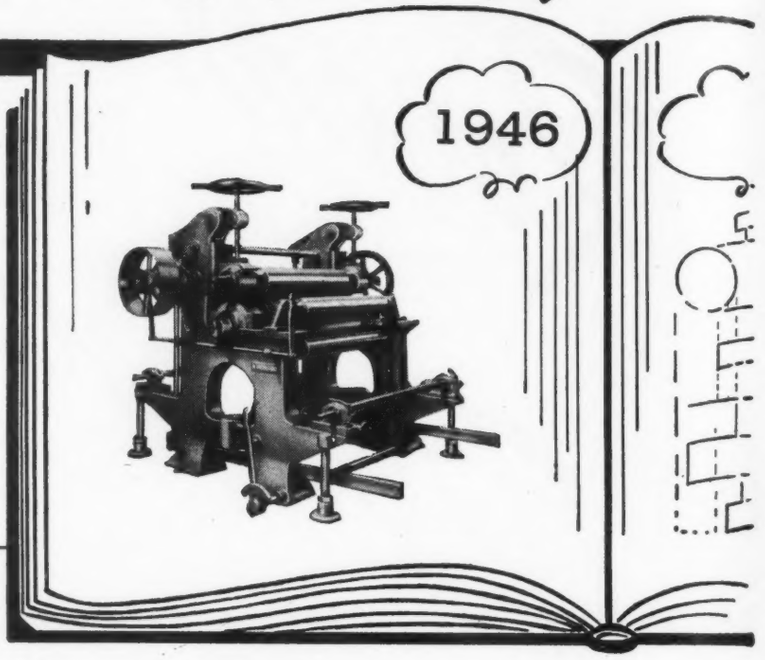
A NORWOOD FIRST *Comes to Life*

Here is the first unit in Norwood's postwar line of paper finishing machines — the Norwood Medium Duty Embossing Machine for widths to 65 inches. Completely equipped with anti-friction bearings, this Norwood achievement is built for the high speeds and high pressures of today and the future.

Belt drive, as shown, or variable speed motor drive, according to your power facilities—screw and lever pressure unit to which pneumatic or hydraulic pressure may be added as original equipment or at a later date—open-face construction for quick roll changes—these are construction features that make the Norwood Embossing Machine outstanding.

In short, here is the ideal Rotary Embosser for use on Cover Papers, Papetries, Greeting Cards, Box and Packaging Papers and Artificial Leather—built by Norwood to meet the needs of today's packaging industry. Other models under construction to meet every requirement of speed, pressure or width.

C-3

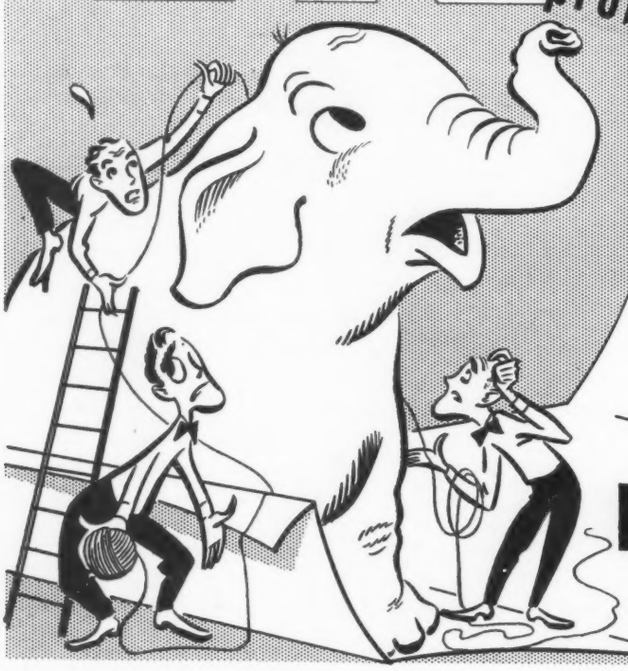


The NORWOOD ENGINEERING COMPANY

14 No. Main St. • Florence, Mass.

"If you use Paper - you can use Norwood"

BIG packaging problem?



. . . USE OUR *Complete* PACKAGING SERVICE!

Big job or small one, Stevens-Wiley has the facilities, the "know-how" and the personnel to see it through quickly and efficiently. For handling all types of Dry Materials, chemicals, cosmetics and household products in cartons, cans, set-up boxes, round paper packages or envelopes . . . for mixing, filling, weighing, labeling on high speed automatic equipment . . . you will find it most economical to use the Stevens-Wiley custom packaging service.

WRITE OR CALL FOR ADDITIONAL INFORMATION

THE STEVENS-WILEY MFG. CO., INC.

HANCOCK & W. BERKS STS., PHILA. 22, PA.
REGent 1616

FINE WOODEN CHESTS
BOXES · DISPLAY CASES

"From Standing Timber to Finished Product"

We specialize in the design and manufacture of silverware chests, jewelry and display cases, wooden boxes, packing cases and other wood containers. Your inquiry invited.

ROCK
Manufacturing Company
STOUGHTON, MASSACHUSETTS

A 34 year old machine tells a story . . .

Back in the days when "Get a horse" was heard on every street corner, a man bought an Ermold Semi-Automatic Labeler. Year in and year out this same machine has been standing up against anything that came along. Today, it's still going strong.

This is a typical story of the dependability of an Ermold Labeler. Add to this its ability to apply body and neck labels and foil to practically any size and shape package from 15 drop ampules to gallon jugs and you have a labeling machine that's hard to beat.

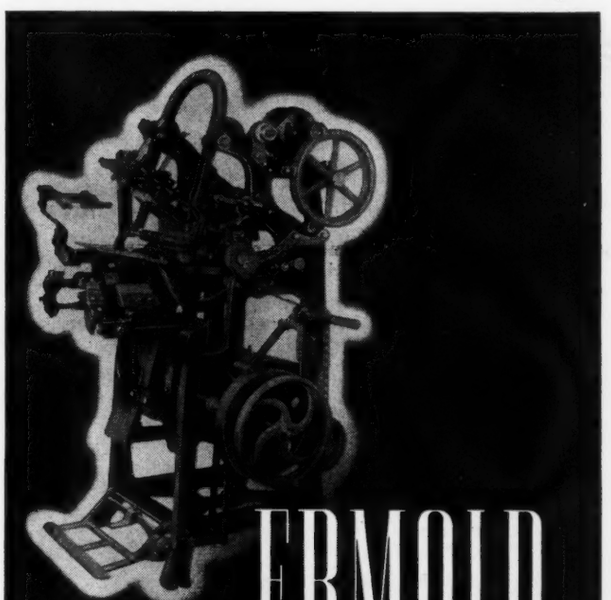
TUBULAR *Paper* PACKAGES

Tubular Paper Packages have very wide use under present post-war conditions. They are sturdy, lightweight, and can be attractively decorated in a wide range of colors.

DIAMETERS: 1/16" TO 2½" IN ANY LENGTHS

Ask for Quotations

DIAMOND STRAW & MACHINE CO
114-116 East 16th Street
New York DIAMOND N. Y.

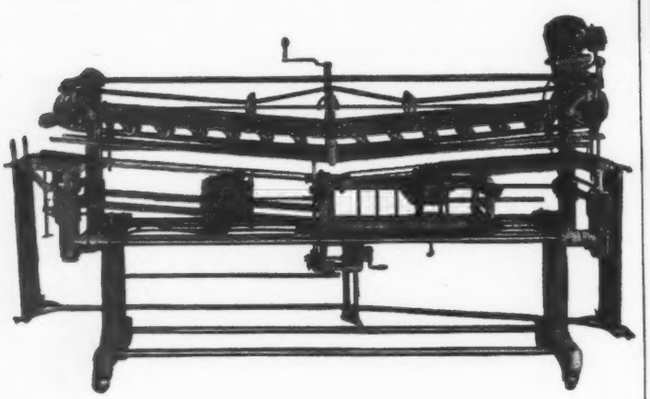


ERMOLD
LABELERS
EDWARD ERMOLD COMPANY
652 Hudson Street, New York 14, New York

NEW WAY LABELER

Rugged construction *to assure you of years of constant operation . . .*

Easy-Maintenance features *to minimize shutdowns for servicing . . .*



COMPARE THESE FEATURES:

- Precision-built throughout, with all parts machined.
- Patented aligning device keeps labels centered at all times.
- 27-inch width permits using in narrow aisles.
- Less lap-end paste required.
- Enclosed glue pot prevents contamination of gum.
- Thermostatic heat control assures positive maintenance of temperature.
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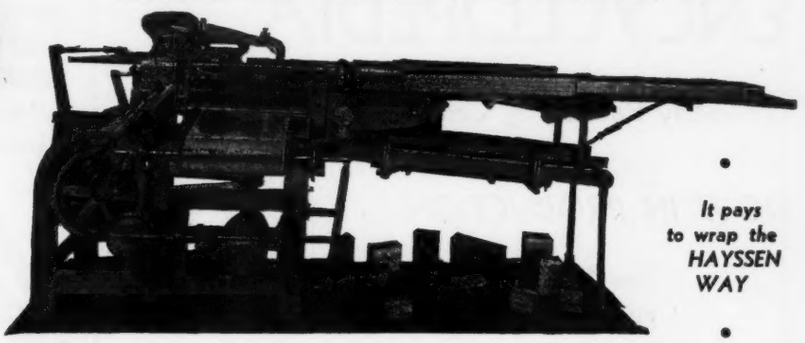

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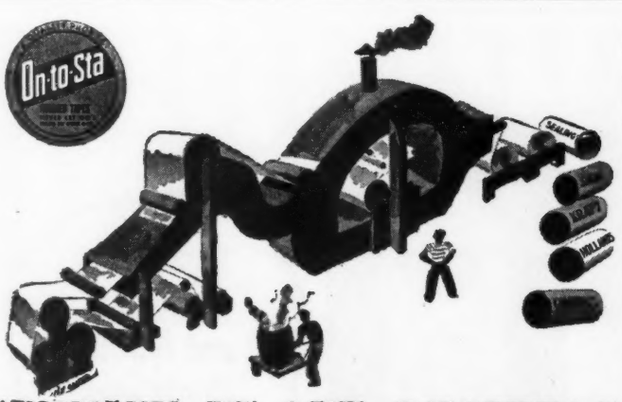

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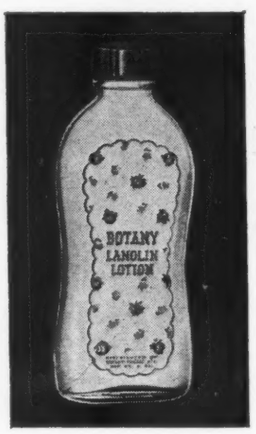

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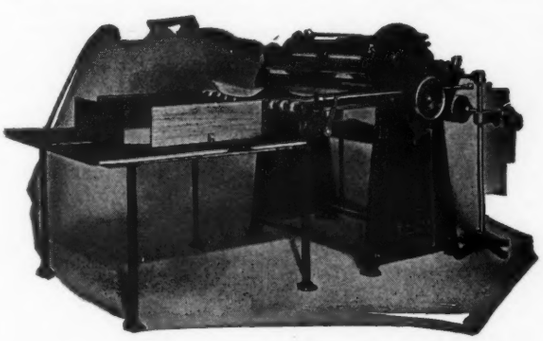

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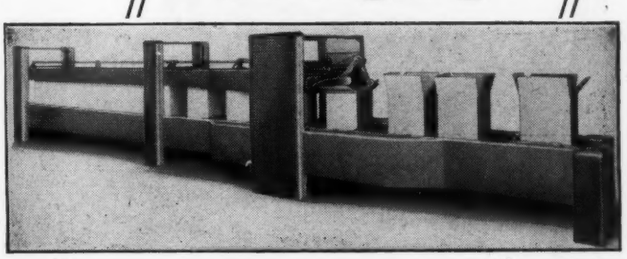

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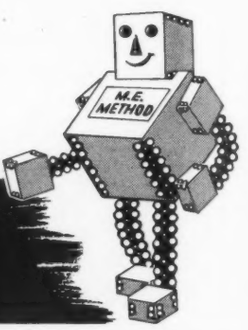

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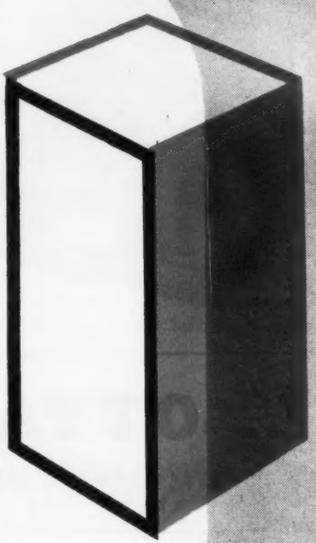

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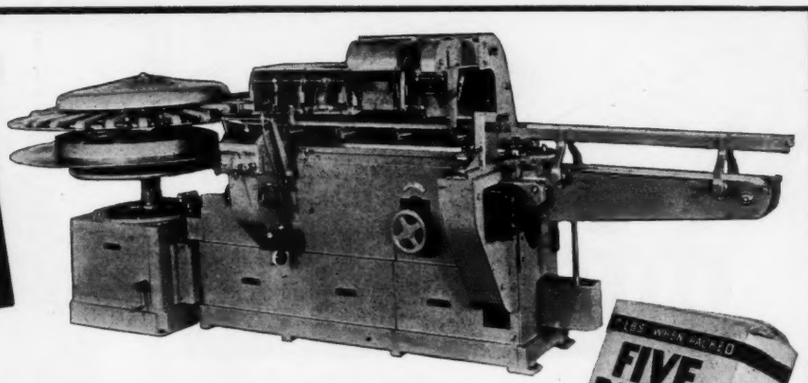

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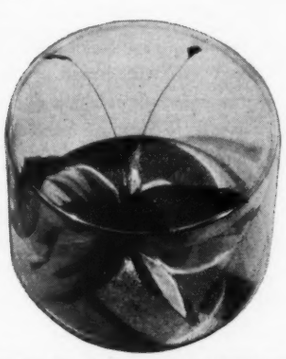

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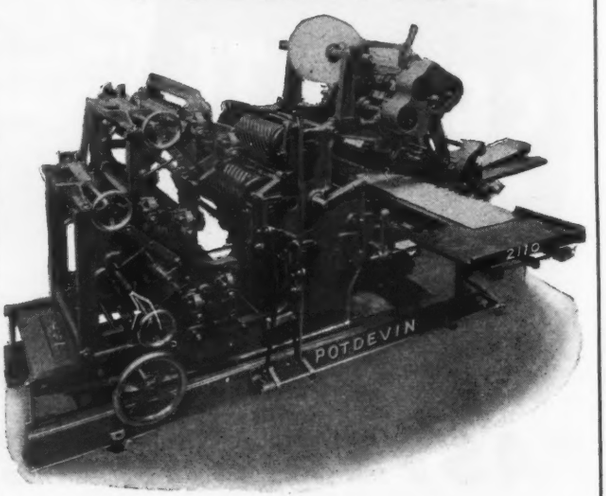

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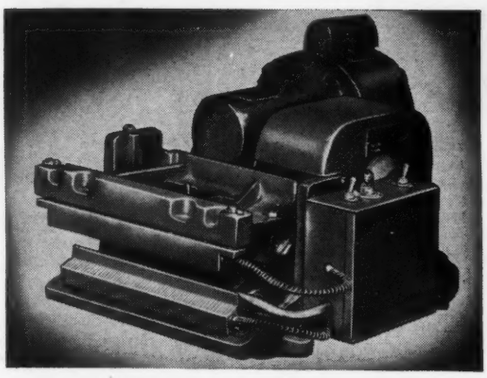

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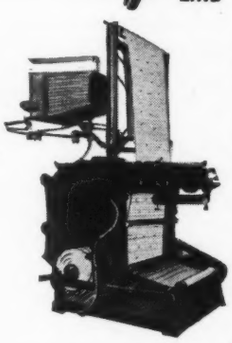

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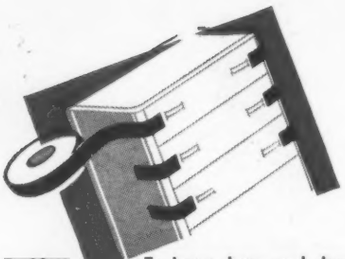

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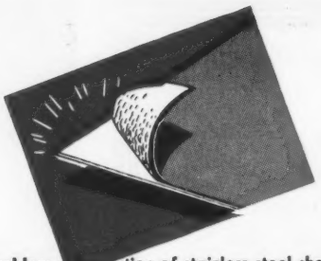

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Group of men with experience ranging from 10 to 18 years in purchasing, sales, manufacturing, machine shop and development in spiral wound fibre cans, fancy round boxes, and transparent boxes seek reputable manufacturer who would like to open up in New York Metropolitan area. Possibility of securing plant now operating. Reply Box 416, Modern Packaging.

Machine Designer and Draftsman for experimental automatic machines at our Research Division located out in the country in north central Jersey. Ideal working conditions for man who really likes development design work. Box 412, Modern Packaging.

Wanted—Factory Manager experienced man only. Small New England Converting Plant of cellophane, aluminum foil and flexible material. Apply Box 413, Modern Packaging.

PACKAGING PLANT, extensive modern machinery, will custom pack your product for NW territory. Trackage, receiving, shipping, billing, 3 carload refrigerators. 24 inch assembly or sorting conveyor. Cello wrapping. Cello bagging. Labelling. Continuous monorail basket cooking in syrup or oils. Vegetable wash and tray pack or bag. Confections or nuts cook and package. Complete service. Cayol Foods, 626—3rd Ave., No., Mpls., Minn.

Artist Designer—10 years' experience in packaging—color sketches and finishes. Production experience. Desires position with reputable organization. Box 414, Modern Packaging.

Wanted, Auger type powder filling machine. Repairable condition or better. Adjustable for half to two ounce bulk powder packaging. Box 415, Modern Packaging.

Sales Representative in New York City—seeks additional lines for sales representation New York and New England, commission basis, excellent contacts, 10 years' experience selling containers to industrial, oil, chemical, food and distilling companies. Box 411, Modern Packaging.

Having trouble obtaining packaging equipment or materials? If so, our experience in this field can be of service to you. Complete consulting service covering packaging machinery, materials and markets. With manufacturers wide fluctuation in prices and deliveries it pays to investigate before buying. Reply Box 417, Modern Packaging.

Selling used Packaging equipment? To obtain the most for your used packaging equipment consult us. We will act as your agent and find a ready market for your used equipment. Box 418, Modern Packaging.

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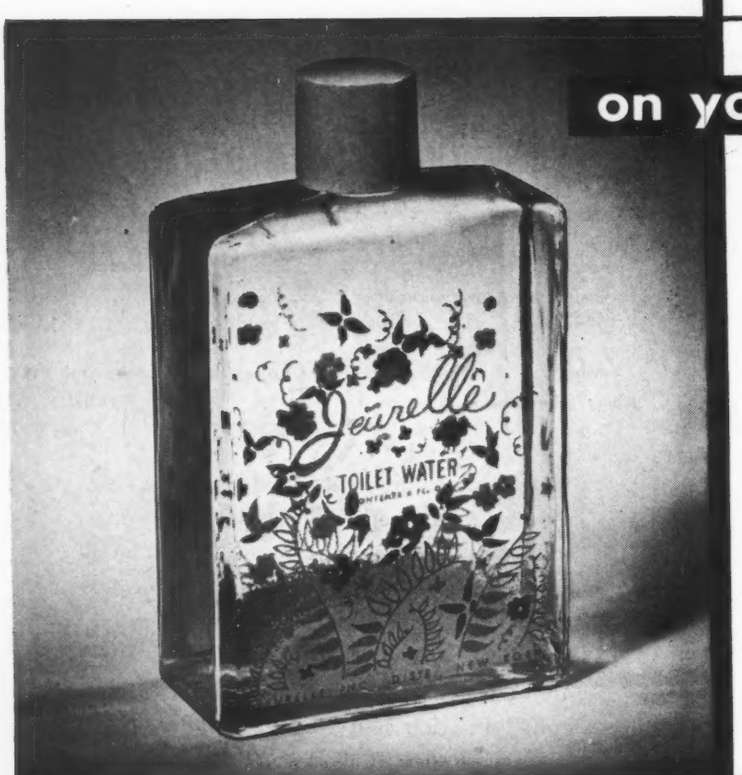

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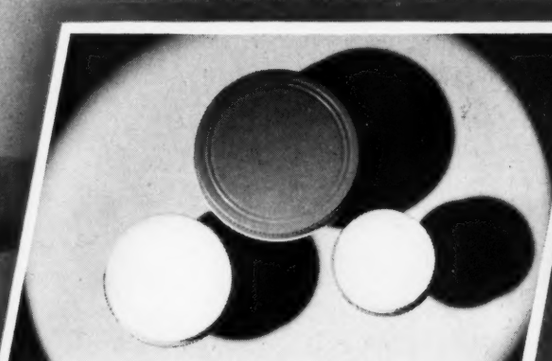

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